

# Mapping LEMAS Data: Potential for Exploring Geographic Patterns in Policing Approaches, Capacities, and Practices

Presented at: NIJ-MAPS Conference  
Saturday, Sept. 10, 2005

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# Objectives

- Explore use of national data sets in examining geographic patterns across local law enforcement agencies
- Exploratory data analysis perspective
- Understanding data capacities and limitations
- Illustrative maps
- Overcoming decentralization and atomistic nature of U.S. policing
- Potential next steps (this presentation is just scratching the surface)

# Law Enforcement Management and Administrative Statistics (LEMAS)

## Quick Facts:

- Administered by the U.S. Department of Justice, Bureau of Justice Statistics (BJS)
- Started in 1987
- Consists of 2 Parts
  - Census
  - Survey

# Law Enforcement Management and Administrative Statistics (LEMAS)

## Census:

- ✓ Comprehensive count of all state and local law enforcement agencies
- ✓ Conducted every 4 years
- ✓ Complete enumeration of agencies, officers, and basic agency functions

## Survey:

- ✓ Detailed sample survey of approximately 3,000 agencies
- ✓ Conducted approximately every 3 years
- ✓ Administered to all agencies having  $\geq 100$  full-time sworn officers
- ✓ Administered to stratified random sample of agencies  $< 100$  FT sworn
- ✓ Consists of long-form for larger agencies (32%) and short-form for smaller agencies (68%)

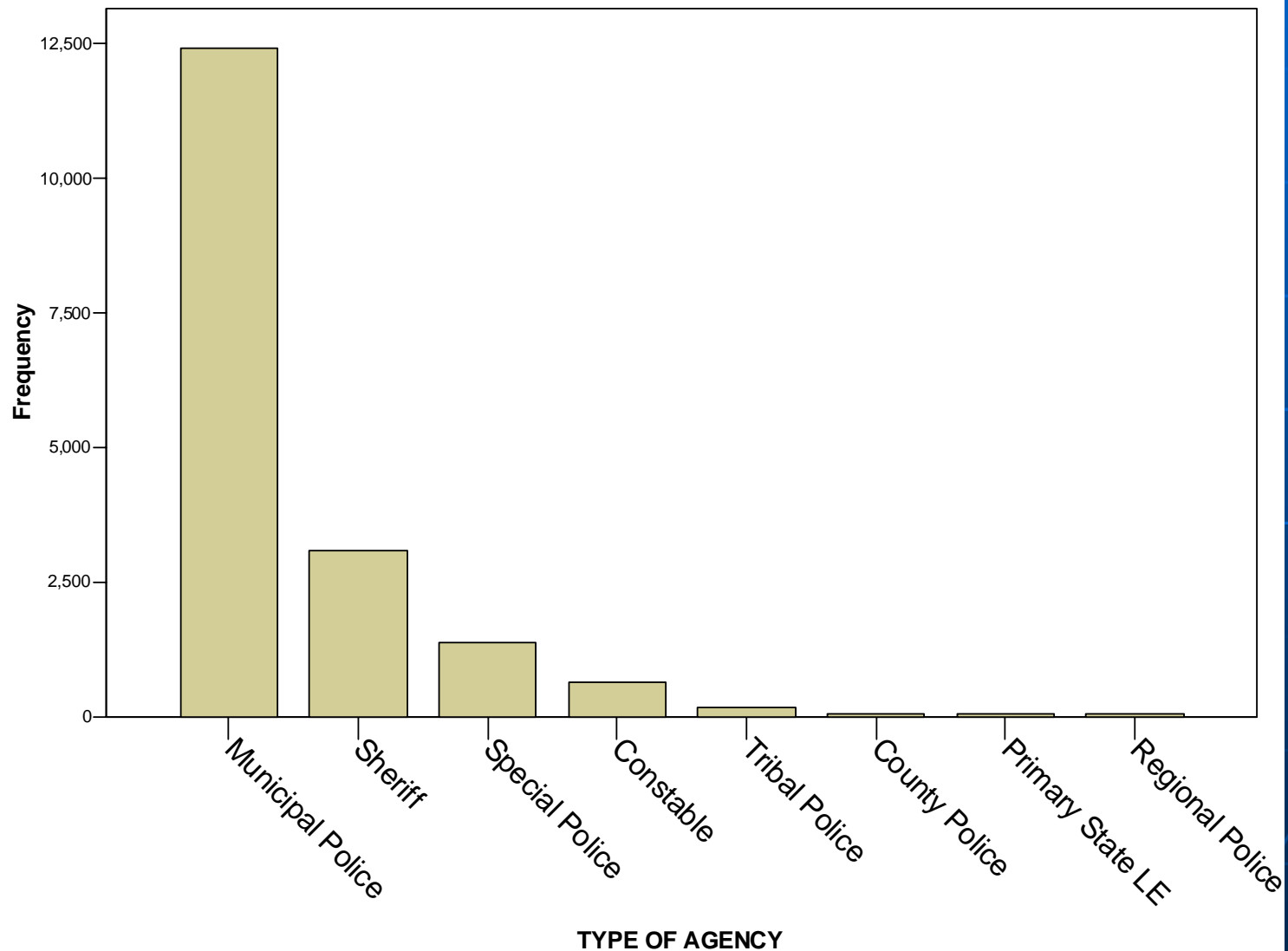
## 2000 LEMAS Census Data

### TYPE OF AGENCY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Municipal Police	12409	69.8	69.8	69.8
	Sheriff	3070	17.3	17.3	87.0
	Special Police	1376	7.7	7.7	94.8
	Constable	623	3.5	3.5	98.3
	Tribal Police	171	1.0	1.0	99.2
	County Police	52	.3	.3	99.5
	Primary State LE	49	.3	.3	99.8
	Regional Police	34	.2	.2	100.0
	Total	17784	100.0	100.0	

Law Enforcement Management and Administrative Statistics (LEMAS)

# 2000 LEMAS Census Data



# Local Agency Stratification for Survey Data

Stratum Definition (FTE Sworn Officers)	$N_h$	$n_h$	Take-Every
$\leq 6$	5,131	314	15.5500
7 - 13	2,925	300	9.6482
14 - 23	1,672	236	7.0889
24 - 39	1,155	233	4.9457
40 - 62	679	201	3.3842
63 - 99	409	190	2.1405

## 2003 LEMAS Survey

### Unweighted Data

AGENCY TYPE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Municipal Police	1889	66.1	66.1	66.1
	Sheriffs Office	863	30.2	30.2	96.3
	Primary State Agency	49	1.7	1.7	98.0
	County Police	39	1.4	1.4	99.3
	Tribal Police	17	.6	.6	99.9
	Regional Police	2	.1	.1	100.0
	Total	2859	100.0	100.0	

### Weighted Data

AGENCY TYPE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Municipal Police	12421	78.8	78.8	78.8
	Sheriffs Office	3061	19.4	19.4	98.2
	Tribal Police	150	1.0	1.0	99.2
	County Police	53	.3	.3	99.5
	Primary State Agency	49	.3	.3	99.8
	Regional Police	31	.2	.2	100.0
	Total	15766	100.0	100.0	

NOTE: Constable police (TX) and special police were dropped from survey sample in 2003. Special police consist of university police, airport police, transit police, etc.



# Practical Limitations of this Exploratory Analysis

- Data not optimized for geo-coding
  - Used zip code\plus-4 as fall-back
  - Not as problematic when maps are viewed on national or statewide level
- Sampling creates problems with geographic representativeness
  - Limits generalizations
  - Stratification creates different levels of “missing observations” depending on agency size
- Maps not as “pretty” as they should be

# Law Enforcement Management and Administrative Statistics (LEMAS)



LEMAS **survey data** can be weighted to produce reliable national level estimates for agencies under 100 full-time equivalent officers

**This weighting cannot be applied to geographic analyses**

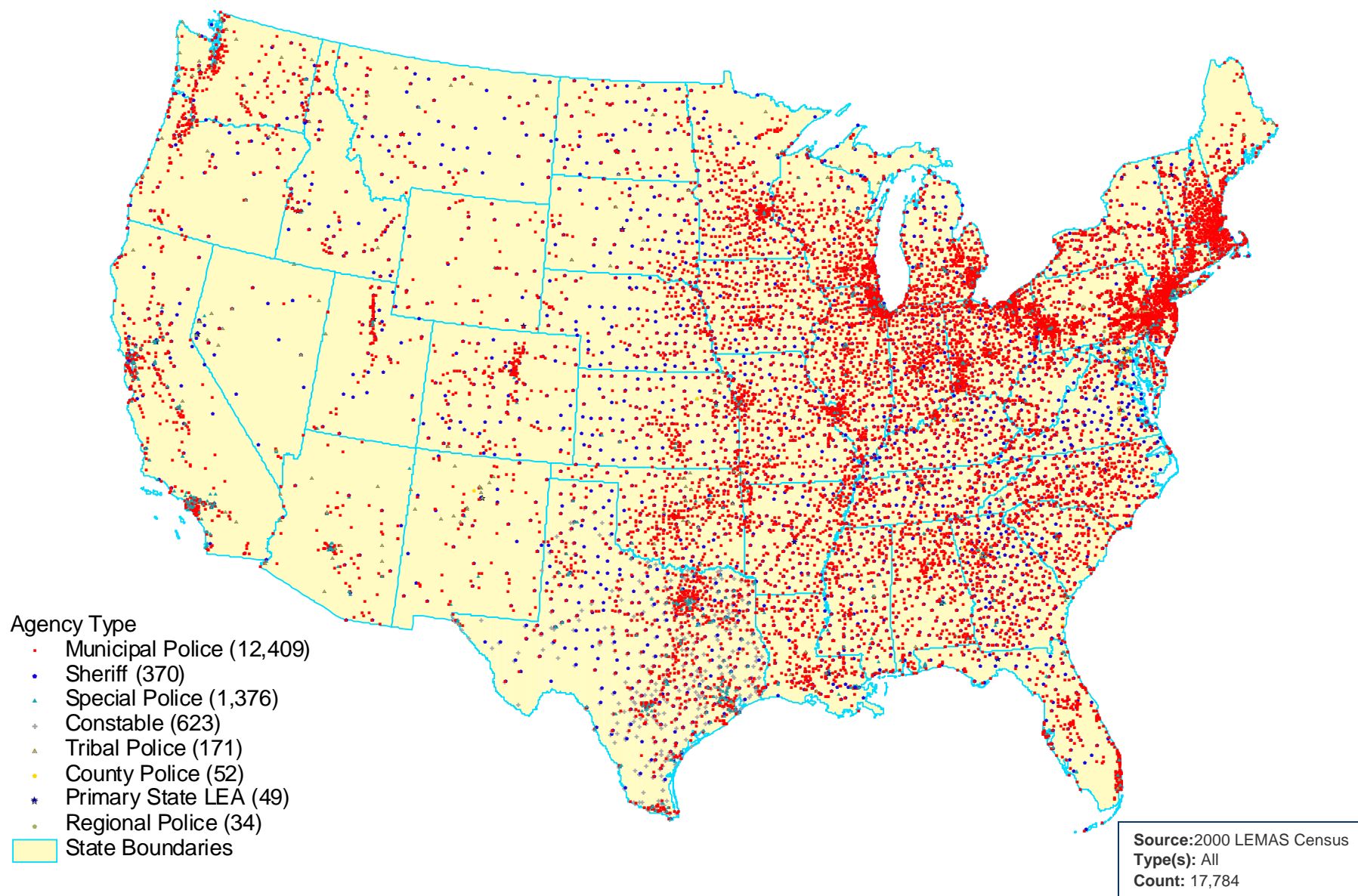


We account for this known limitation by demarking “missing data” where relevant. Missing are data from LEMAS **census** not included in **survey**.

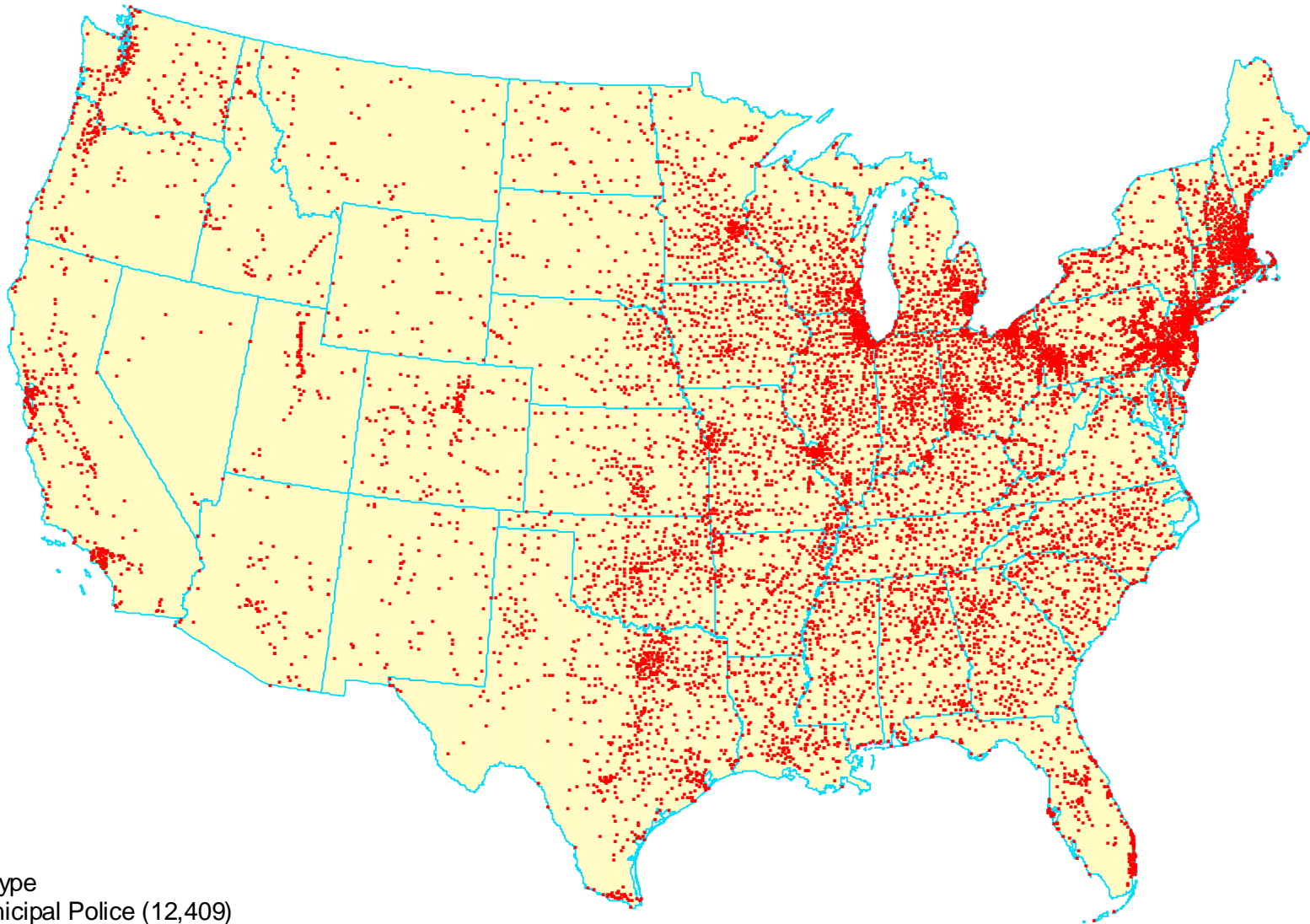
# Geo-coding Results

<u>Matched</u>	<u>16858</u>	<u>94.8%</u>
Not matched	926	5.2%
Of those matched		
Street Matched	15822	89.0%
Point Zip (S6)	1076	6.1%
Street Level(S5)	8961	50.4%
ShapePath (S4)	0	0.0%
ZIP+4 (S3)	105	0.6%
ZIP+2 (S2)	265	1.5%
ZIP Code (S1)	5415	30.4%
No Centroid (S0)	0	0.0%
ZIP Centroid Matched	1036	5.8%
Point Zip (Z6)	85	0.5%
ZIP+4 (Z3)	42	0.2%
ZIP+2 (Z2)	6	0.0%
ZIP Code (Z1)	903	5.1%
No Centroid (Z0)	0	0.0%
Intersection Matches	0	0.0%

# LEMAS Census All Agency Types



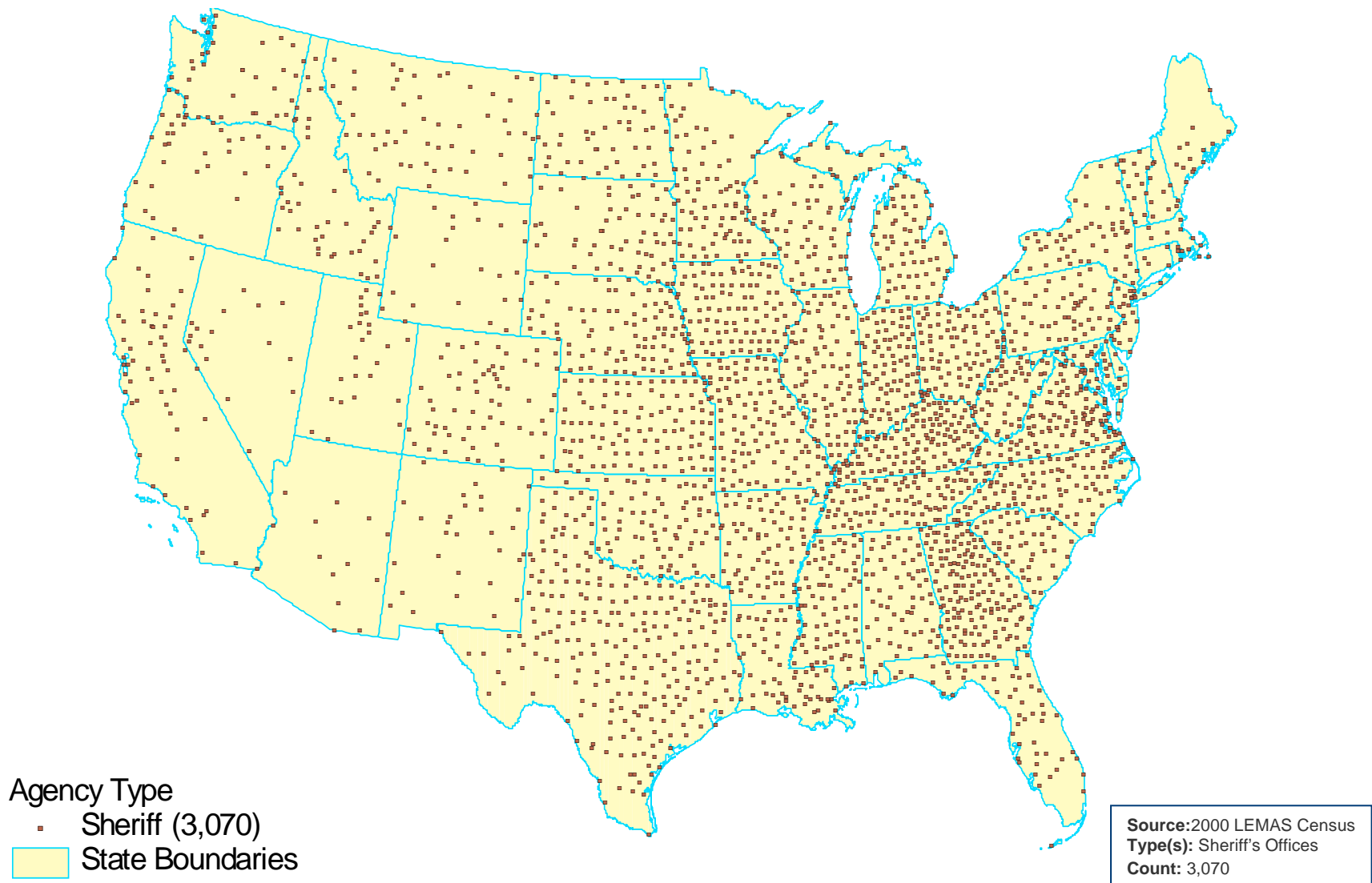
# LEMAS Census Municipal Agencies



Agency Type  
• Municipal Police (12,409)  
State Boundaries

Source: 2000 LEMAS Census  
Type(s): Municipal Police  
Count: 12,409

# LEMAS Census Sheriffs Offices

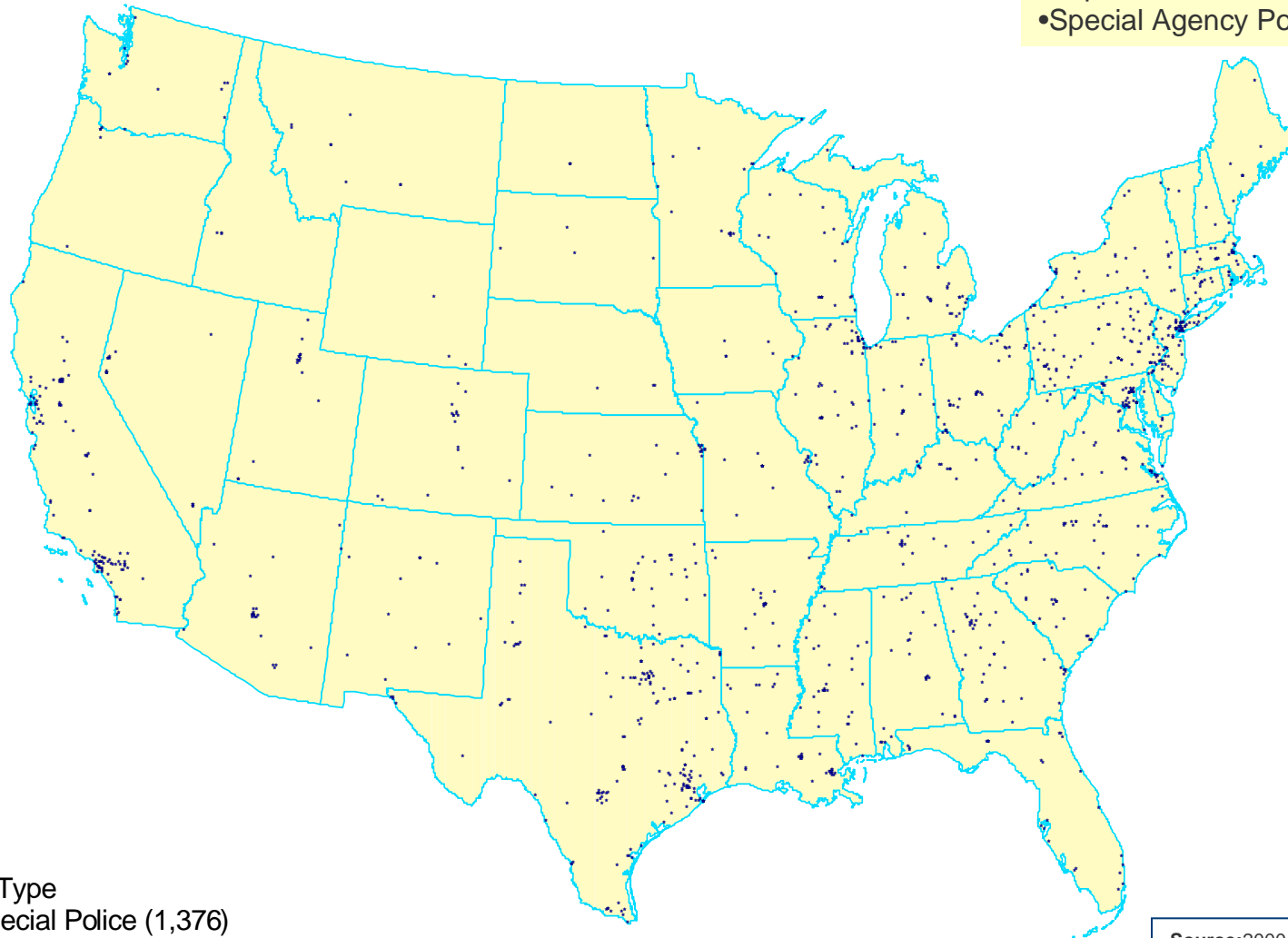


# LEMAS Census Special Police

Examples:

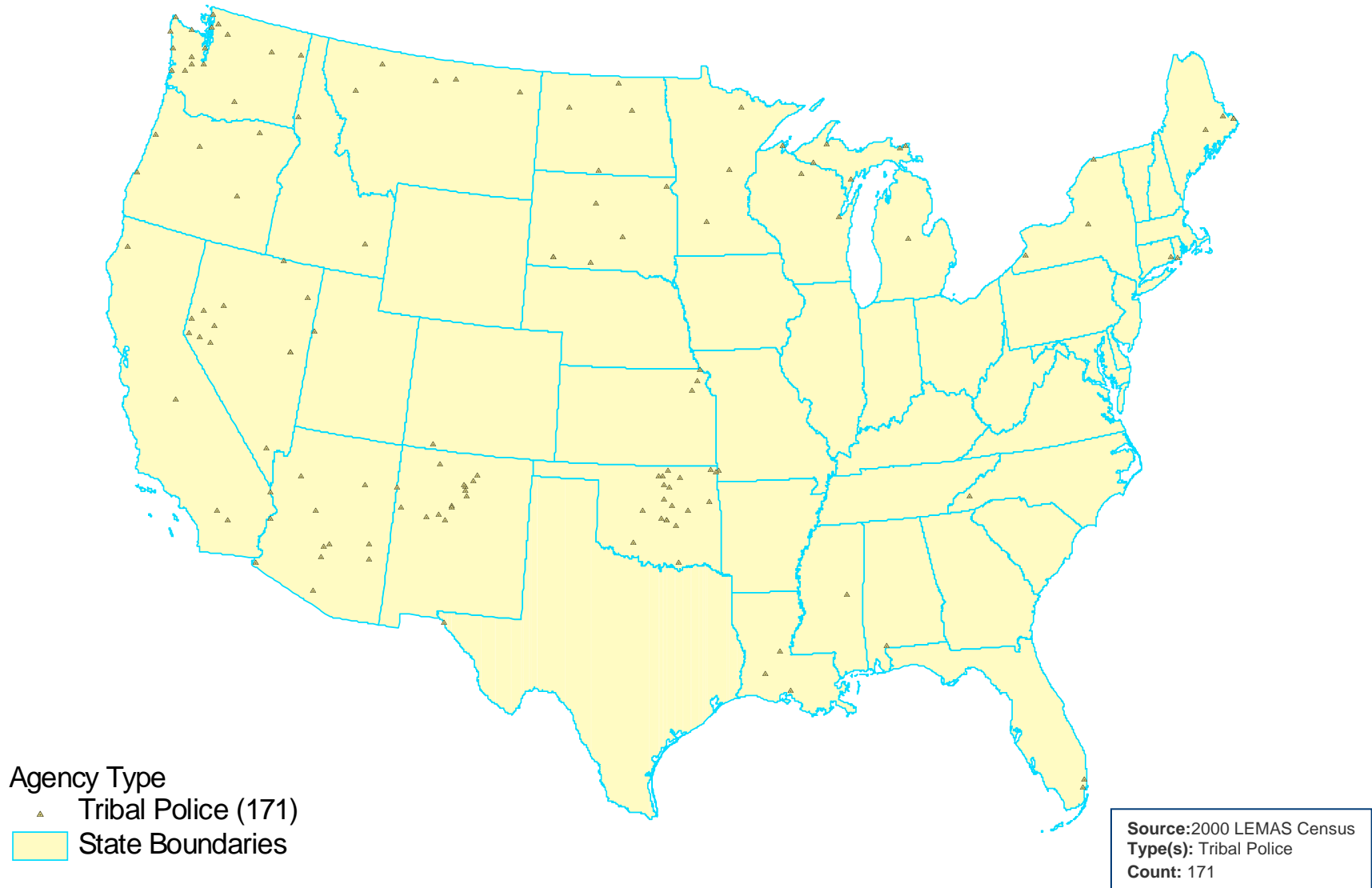
- University Police
- Forest Preserve Police
- Airport Police
- Special Agency Police

Agency Type  
· Special Police (1,376)  
■ State Boundaries



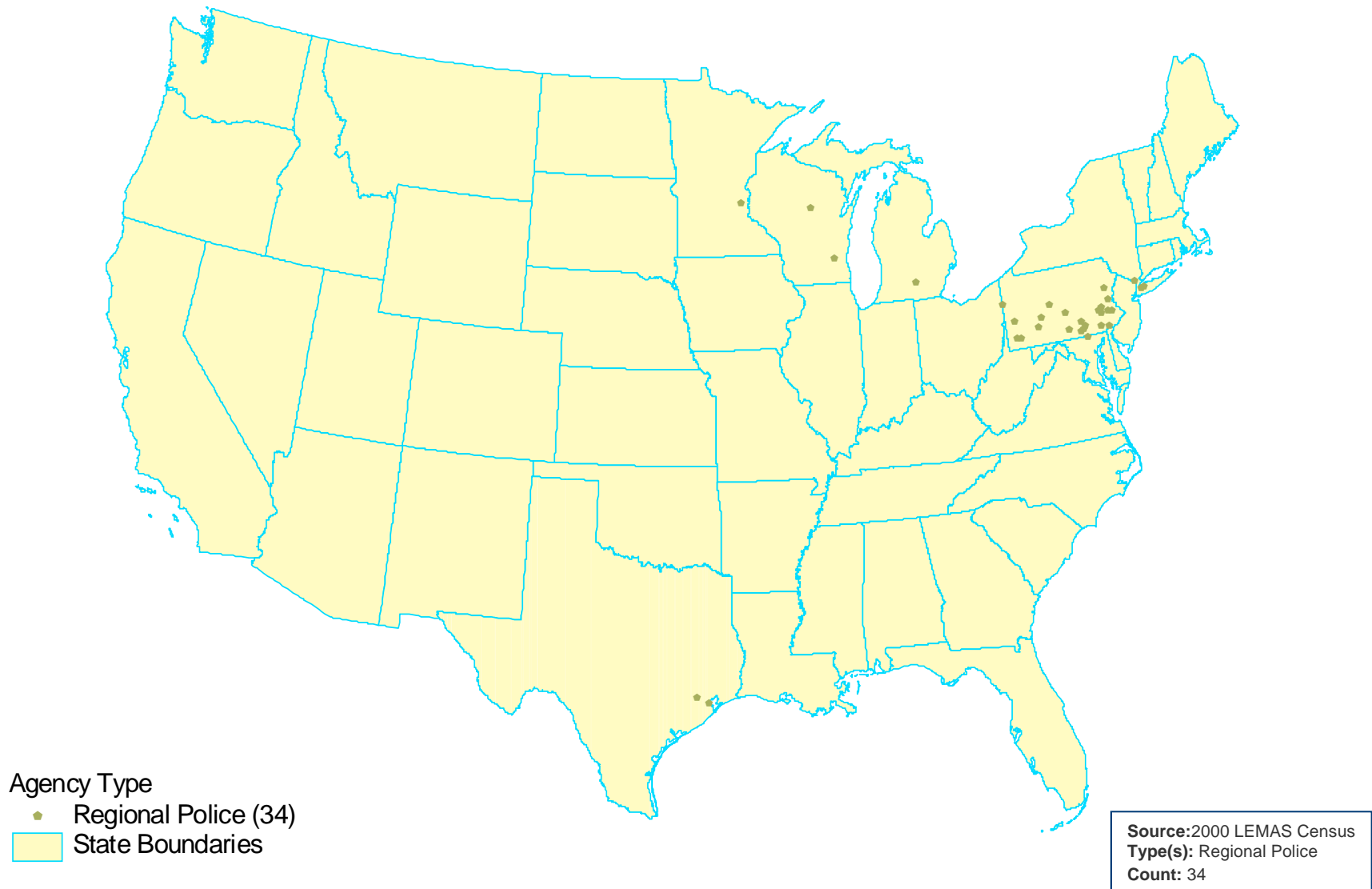
Source: 2000 LEMAS Census  
Type(s): Special Police  
Count: 1,376

# LEMAS Census Tribal Police

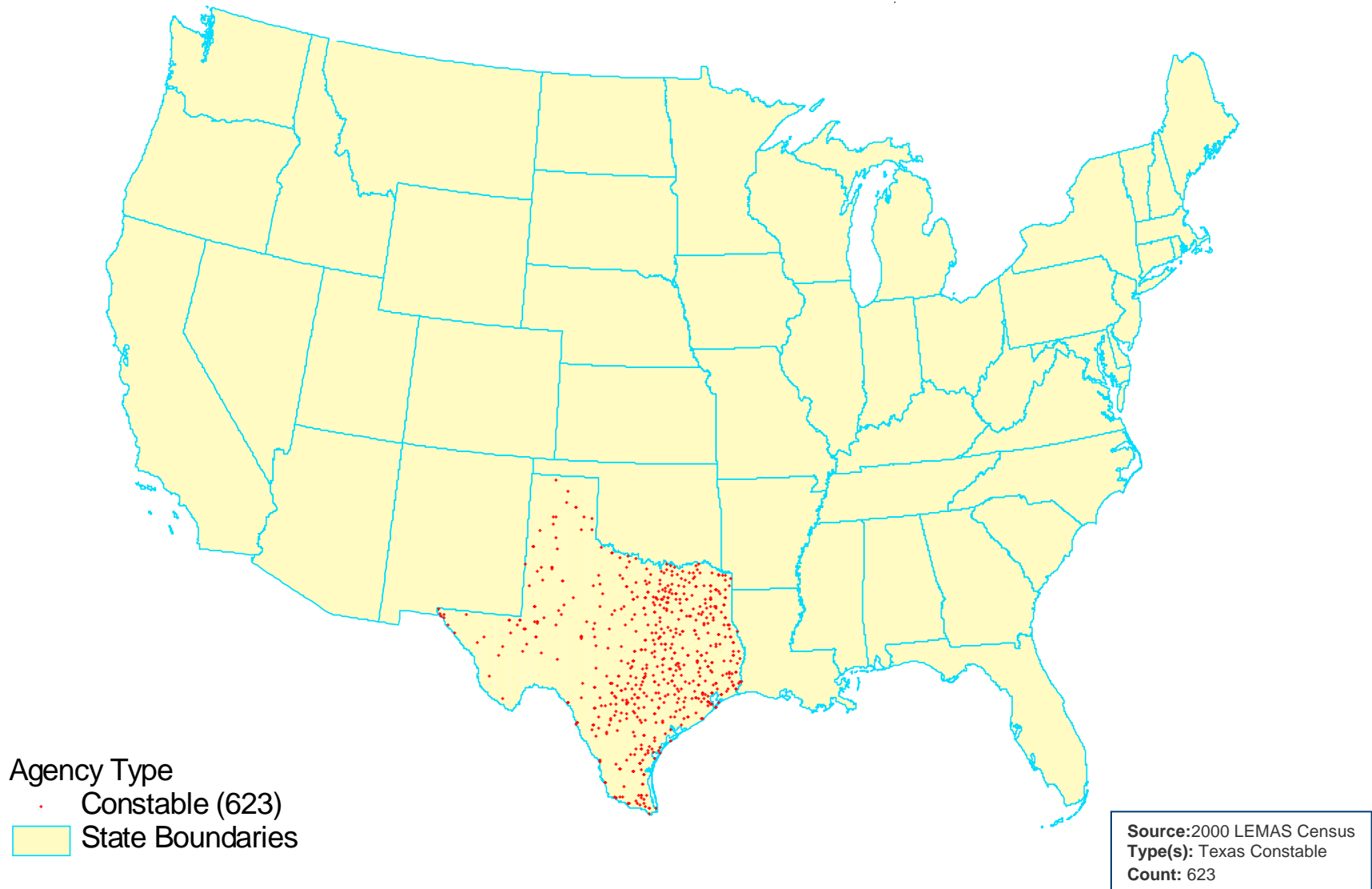




# LEMAS Census Regional Police



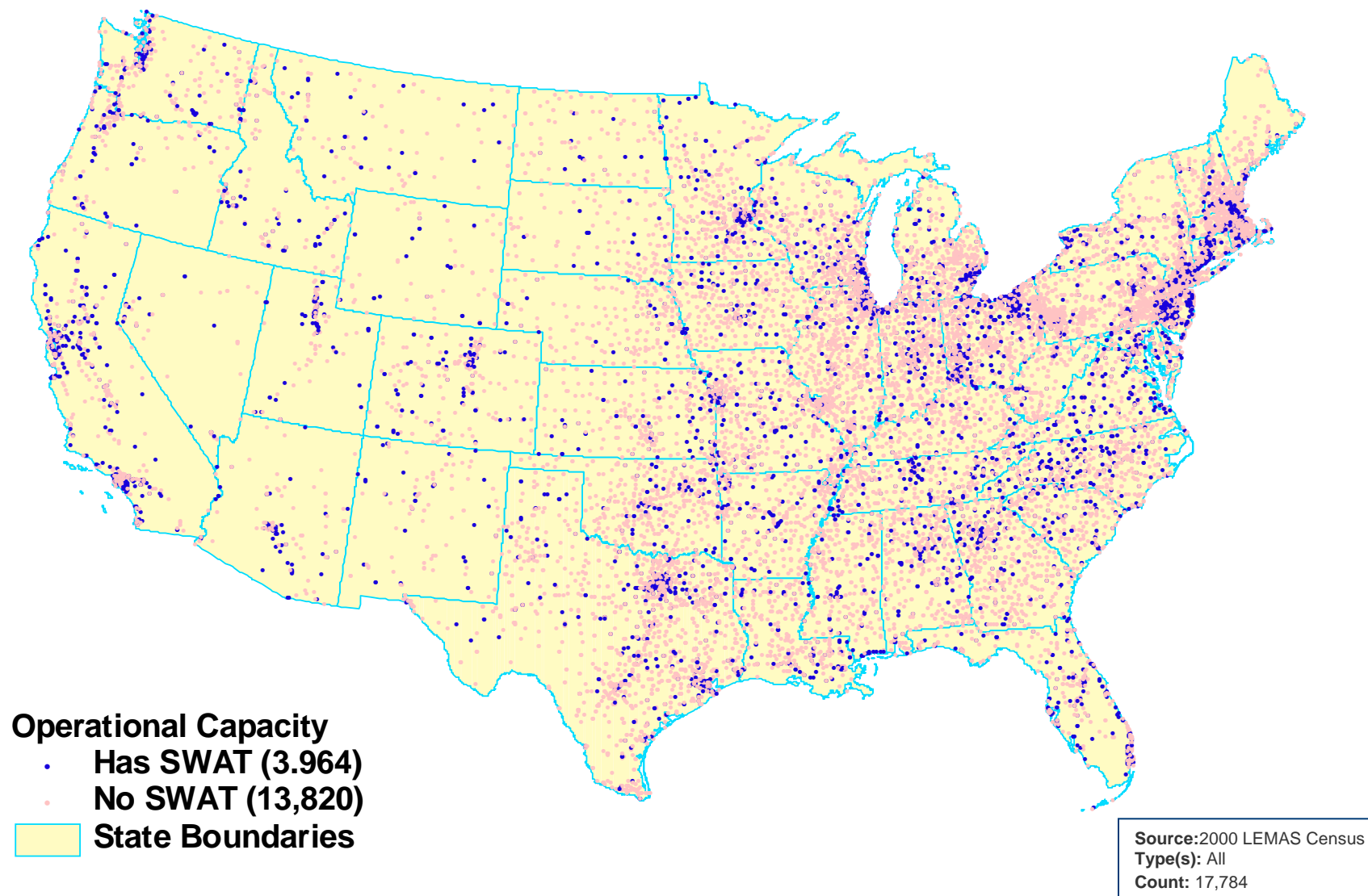
## LEMAS Census Constables (Texas)



Capacity  
and  
Attribute Data  
from  
**LEMAS Census**

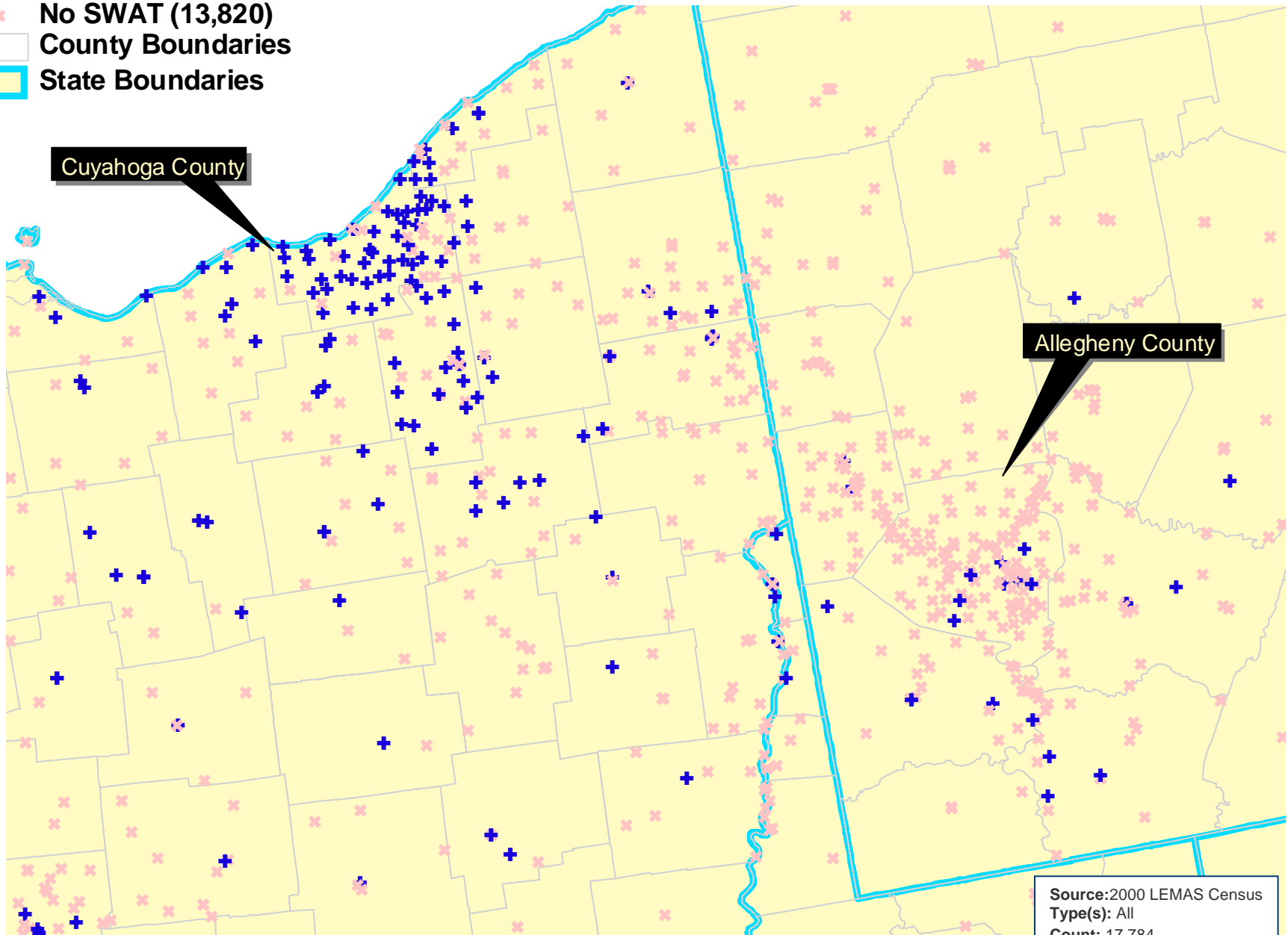
Which of the following functions did your agency perform on a routine basis during the 12-month period ending June 30, 2000?

### **Tactical Operations (SWAT)**



## Operational Capacity

- + Has SWAT (3,964)
- x No SWAT (13,820)
- County Boundaries
- State Boundaries

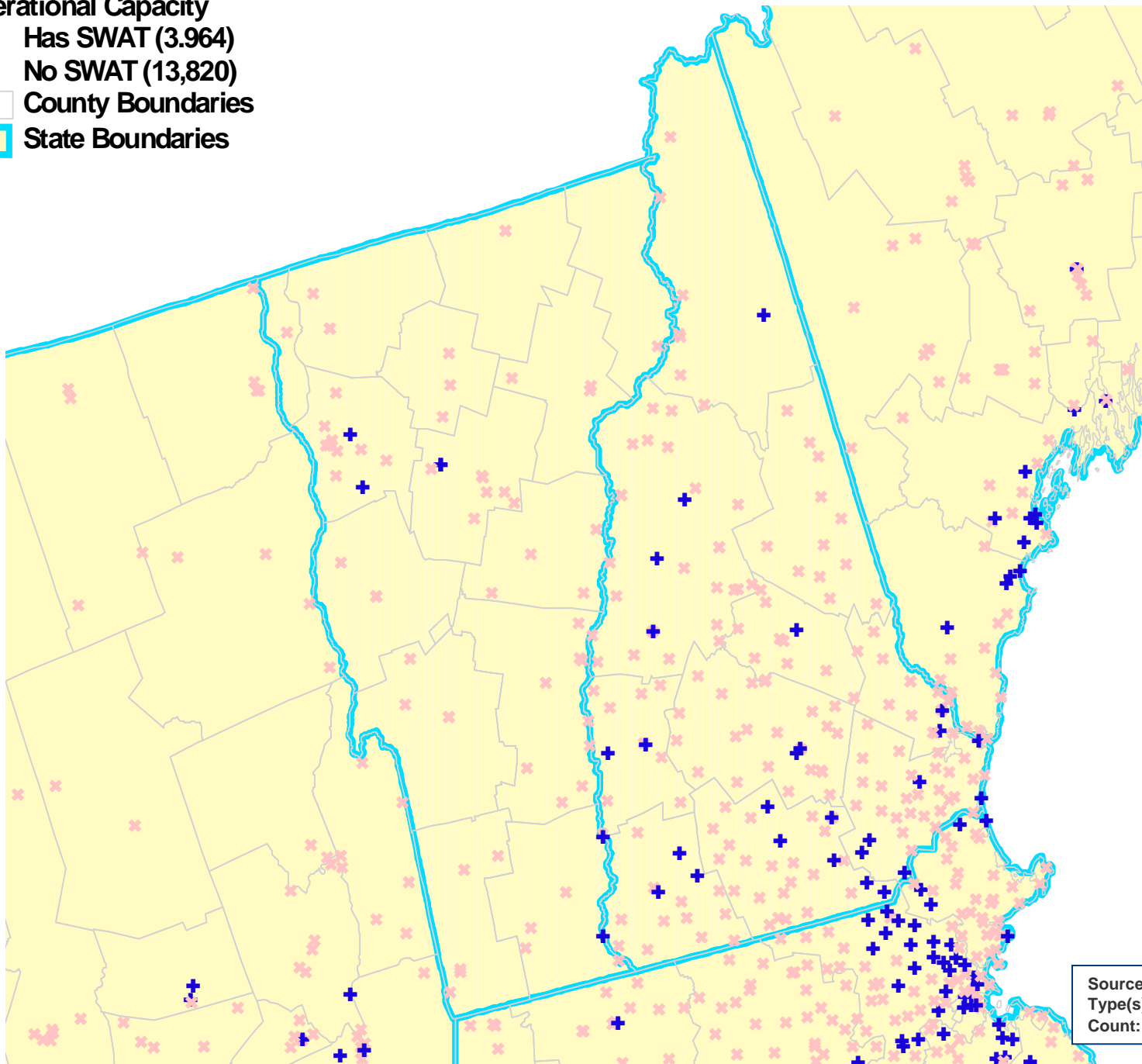


**Operational Capacity**

- + Has SWAT (3,964)
- x No SWAT (13,820)

County Boundaries

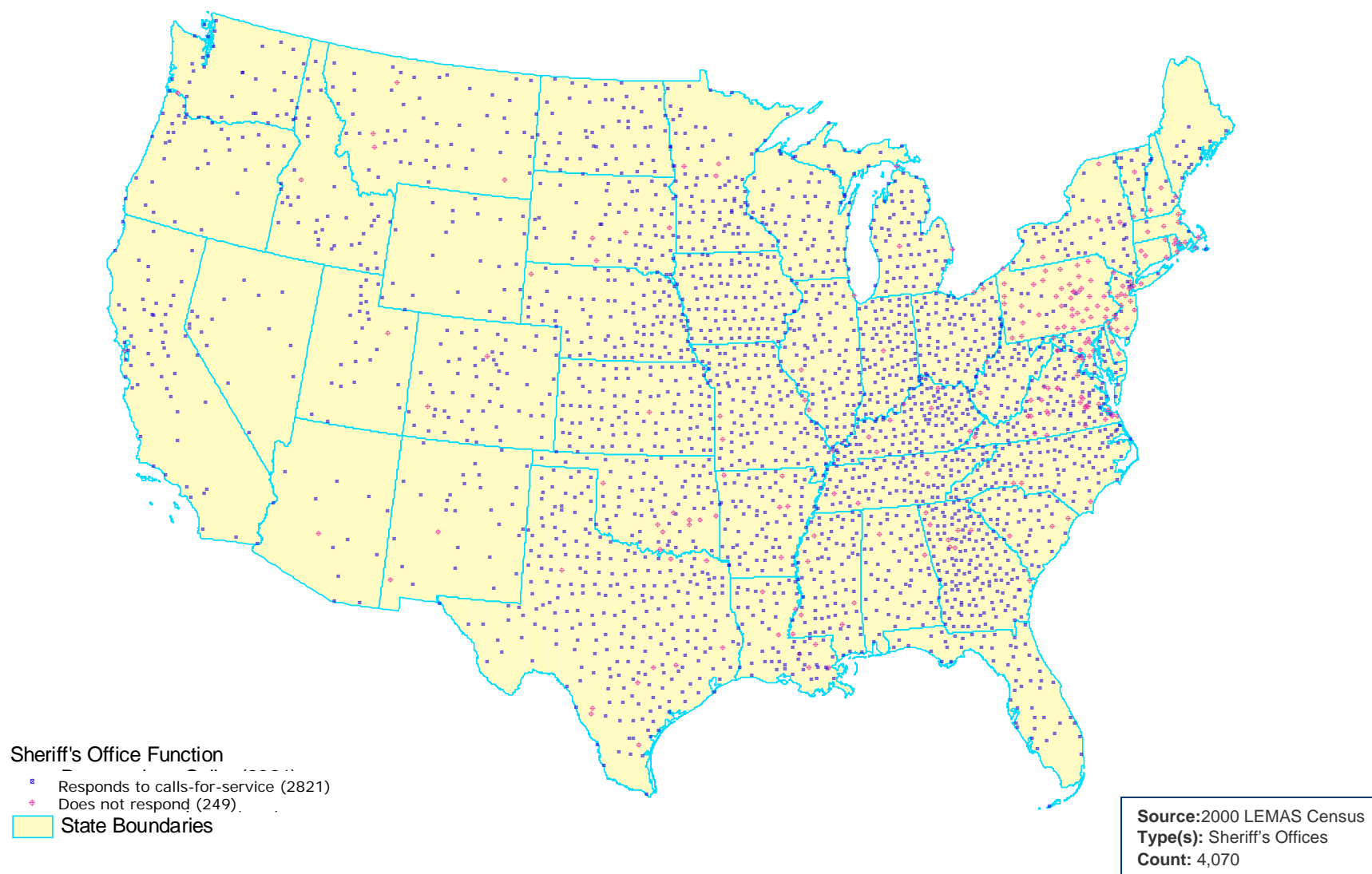
State Boundaries



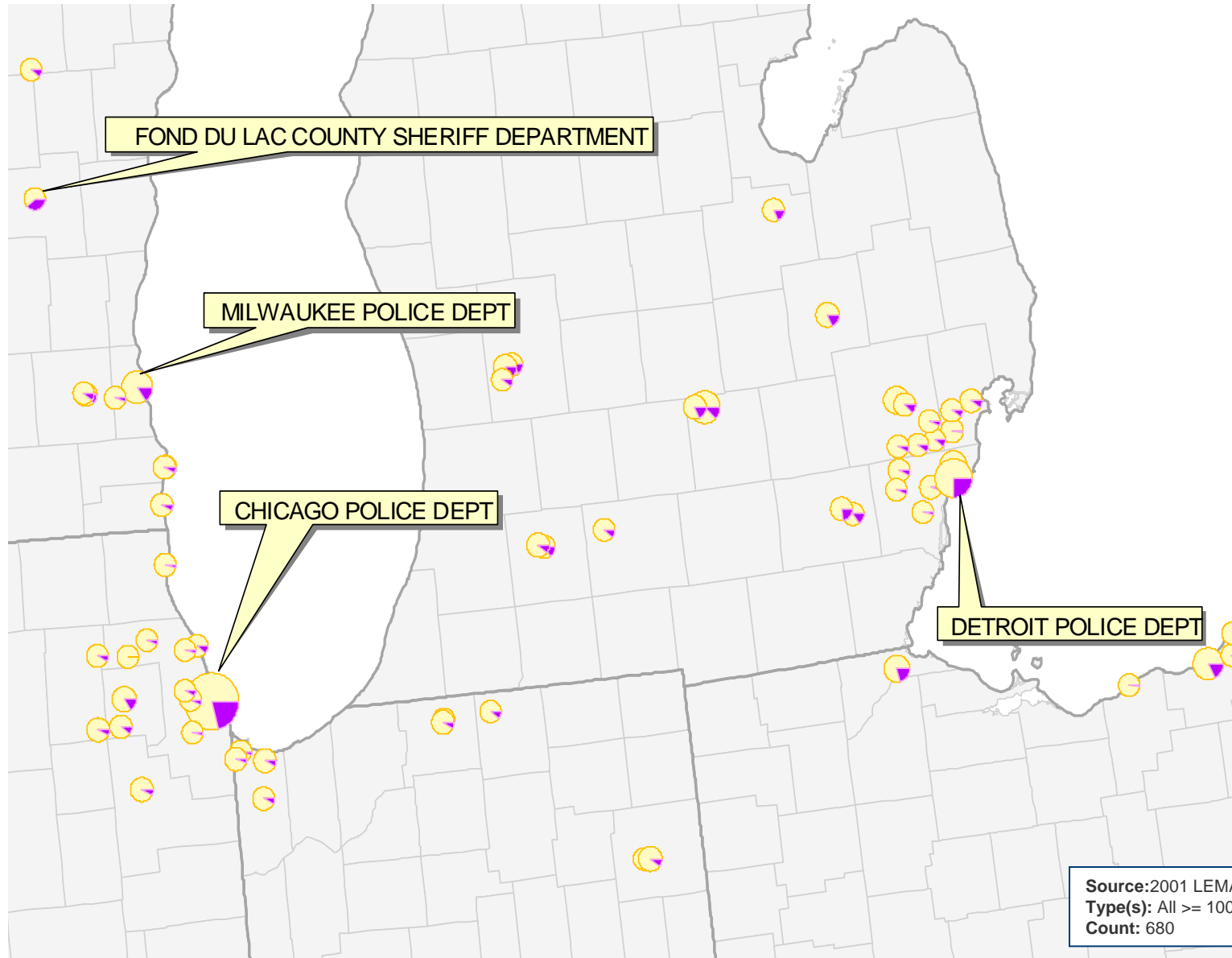
Source: 2000 LEMAS Census  
Type(s): All  
Count: 17,784

Which of the following law enforcement services did your agency provide on a regular basis during the 12-month period ending June 30, 2000?

## Responding to Citizen Calls



**Departments with  $\geq 100$  Full-Time Sworn Officers  
Graduated by Size and Indicating Percent Female (in purple)  
Sample Close-up**



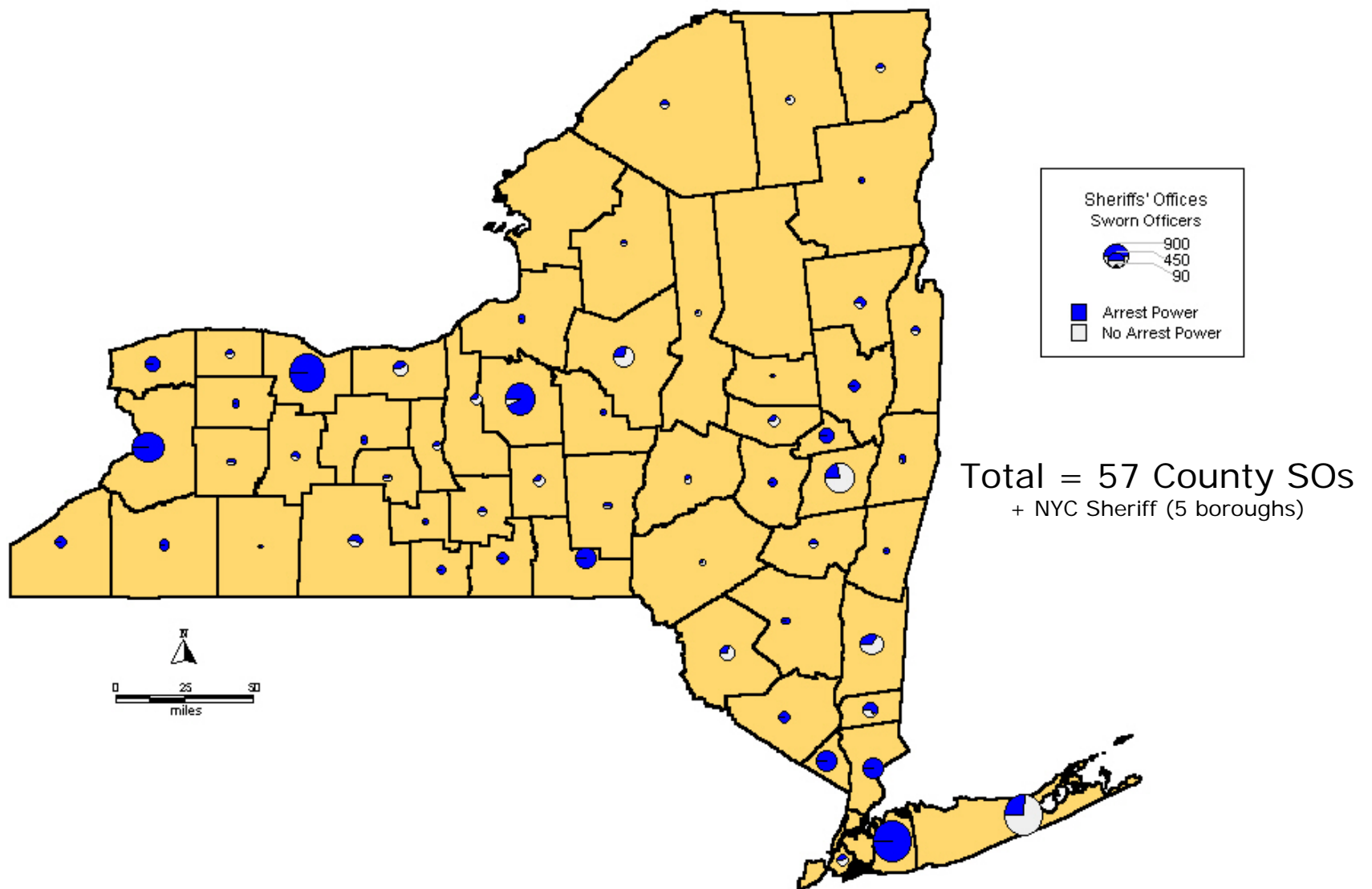


Sheriffs' Offices  
Sworn Officers

900  
450  
90

Arrest Power  
No Arrest Power

Total = 57 County SOs  
+ NYC Sheriff (5 boroughs)



# Other Data Analysis Possibilities

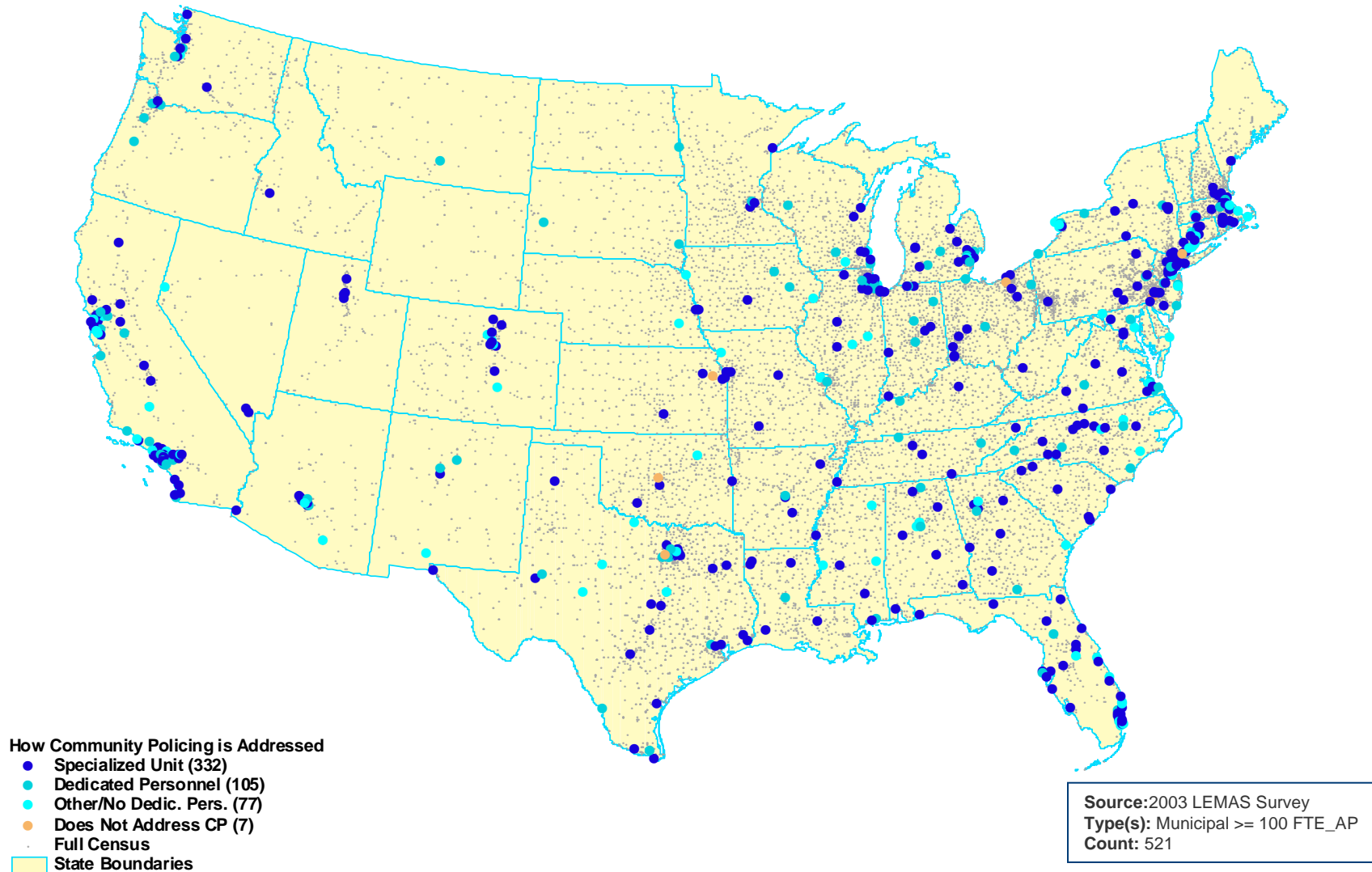
(Optimized with Polygon Thematics)

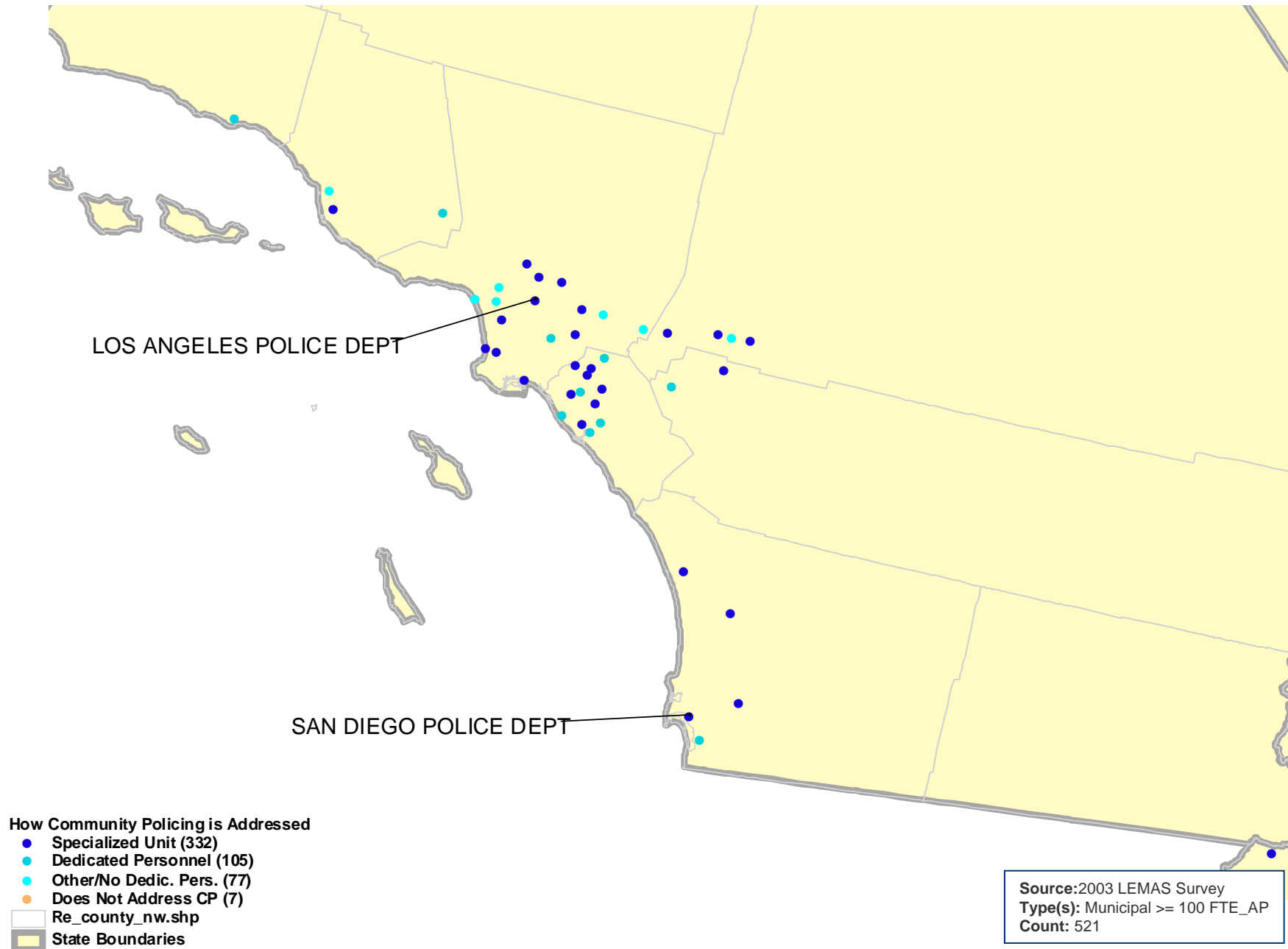
- Staffing Shortages (2000 census did not reveal substantial shortages)
- Staff called up for military services (Part of 2003 survey)

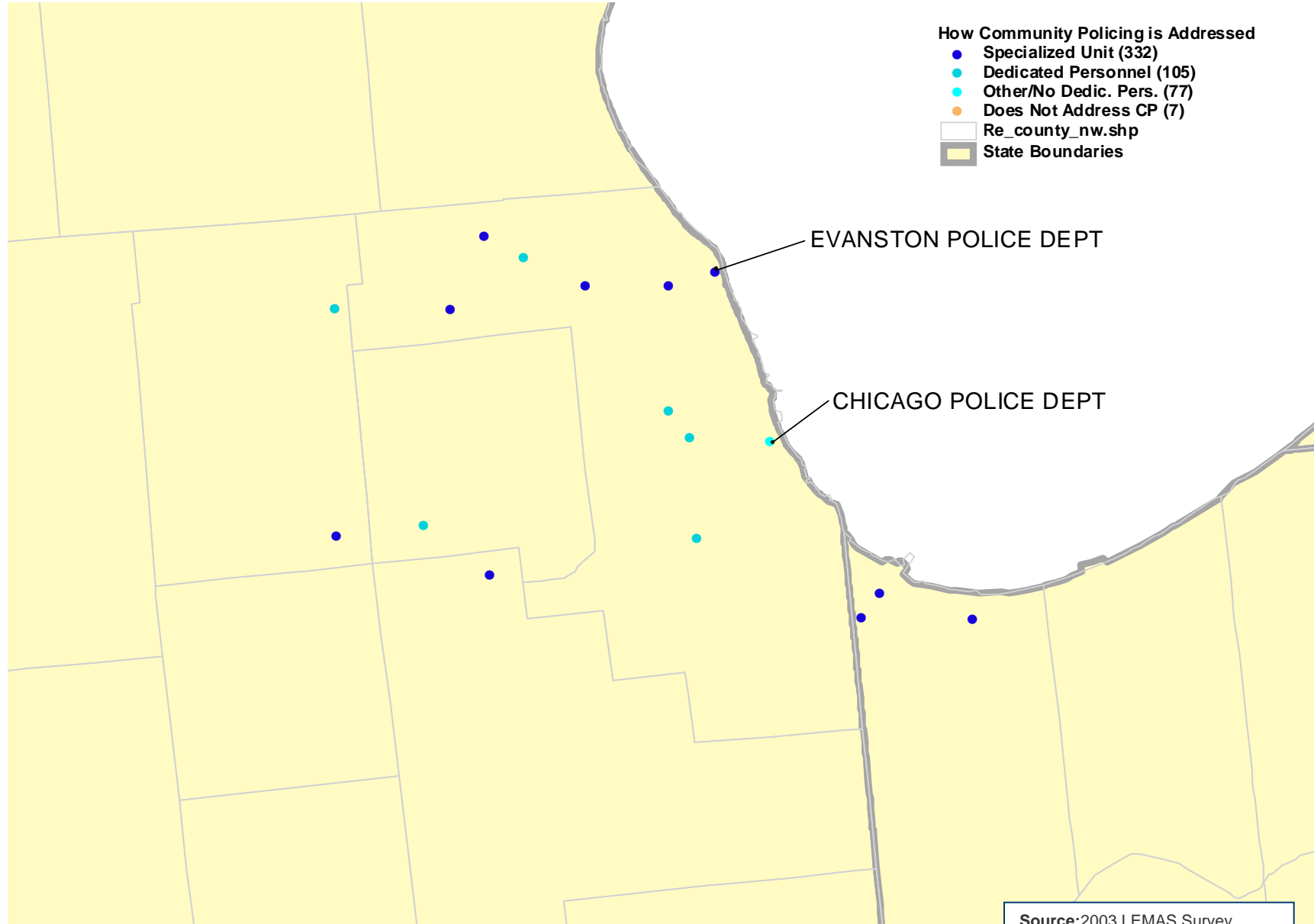
STATE	AGENCY NAME	# F/T Sworn w/ Arrest Power (June 30, 2003)	# F/T Sworn w/ Arrest Power called up for military reserve (June 30, 2003)	Percent Called Up
GA	NEWTON POLICE DEPT	3	1	33.33
	SAVANNAH POLICE DEPT	412	125	30.34
	CLAYTON POLICE DEPT	11	1	9.09
	WILKES COUNTY SHERIFF DEPARTMENT	13	1	7.69
	SUMTER COUNTY SHERIFF DEPARTMENT	35	2	5.71
	JEFFERSON COUNTY SHERIFF DEPARTMENT	18	1	5.56
	RICHMOND HILL POLICE DEPT	19	1	5.26
	CARROLLTON POLICE DEPT	62	3	4.84
	VALDOSTA POLICE DEPT	118	5	4.24
	WALKER COUNTY SHERIFF DEPARTMENT	72	3	4.17
	WARNER ROBINS POLICE DEPT	100	4	4.00
	ROSWELL POLICE DEPT	127	5	3.94
	EFFINGHAM COUNTY SHERIFF DEPARTMENT	52	2	3.85
	GLYNN COUNTY POLICE DEPARTMENT	105	4	3.81
	AUGUSTA/RICHMOND COUNTY SHERIFF DEPT	426	16	3.76
	DEKALB COUNTY SHERIFF DEPARTMENT	268	10	3.73
	CLAYTON COUNTY SHERIFF DEPARTMENT	131	4	3.05
	WALTON COUNTY SHERIFF DEPARTMENT	100	3	3.00

Capacity  
and  
Attribute Data  
from  
LEMAS Sample

# How does your agency address the following problems/tasks?: Community Policing

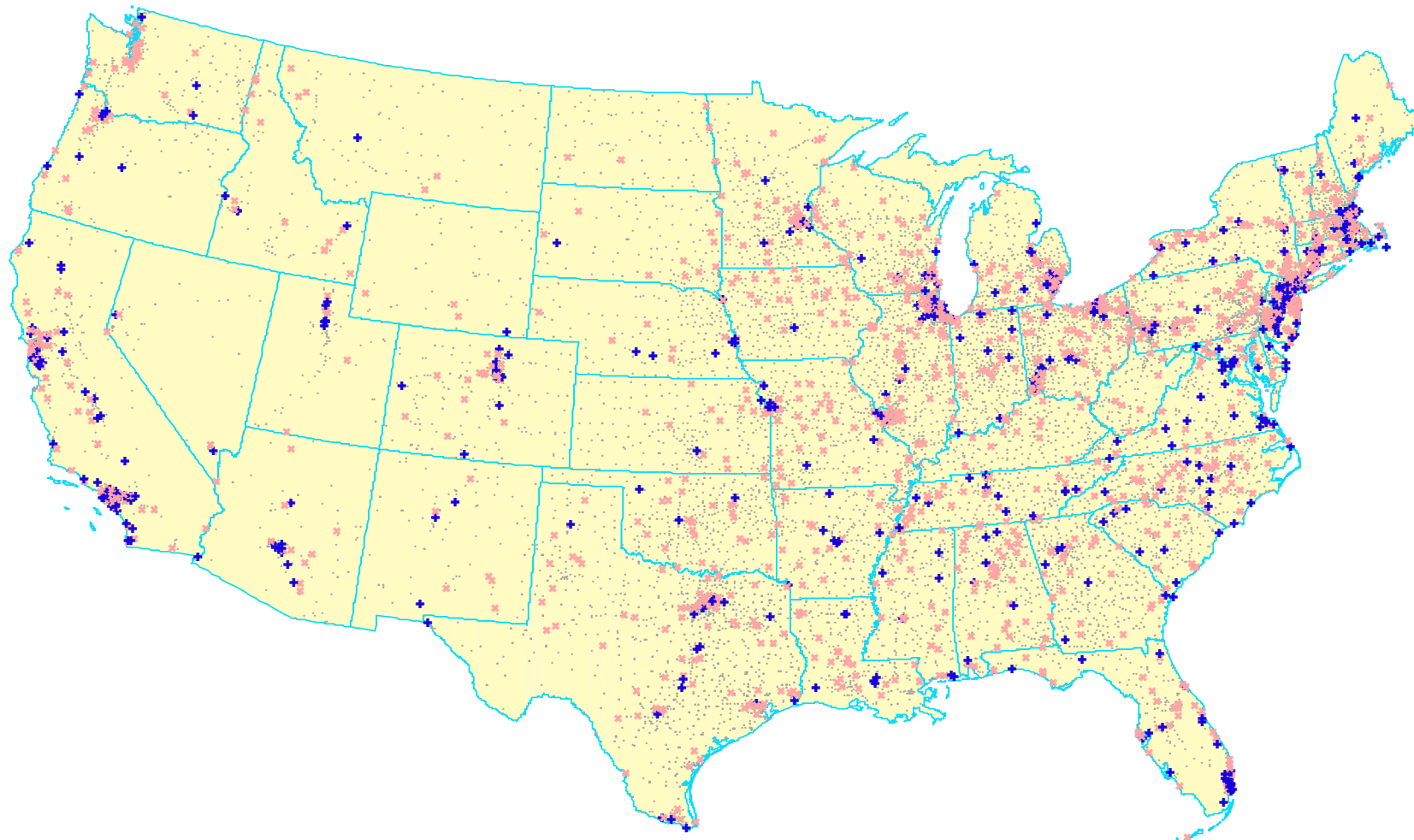






Source: 2003 LEMAS Survey  
Type(s): Municipal >= 100 FTE\_AP  
Count: 521

During the 12-month period ending June 20, 2003, which of the following did your agency do?: Maintained/created formal, written community policing plan

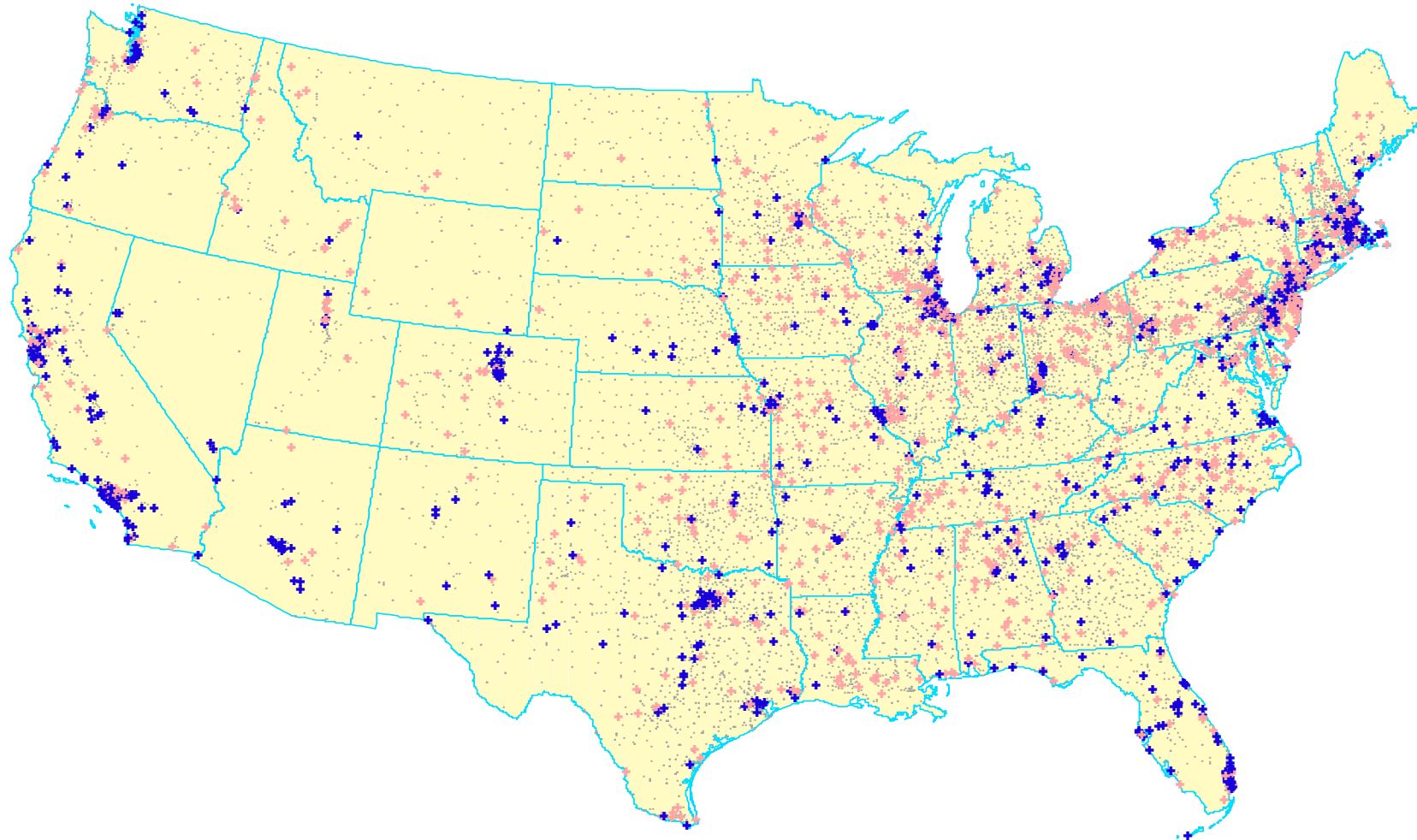


**Sampled Municipal LEAs: Formal, Written Community Policing Plan**

- x No (1387)
- + Yes (496)
- . Full Census
- State Boundaries

Source: 2003 LEMAS Survey  
Type(s): Municipal Sampled  
Count: 1881

During the 12-month period ending June 20, 2003, which of the following did you agency do?: Conducted a citizen police academy



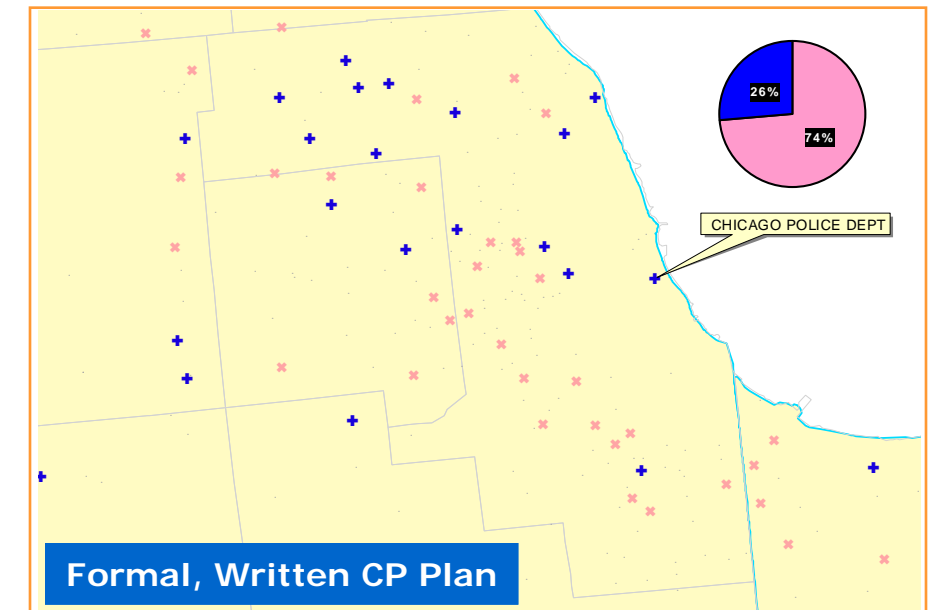
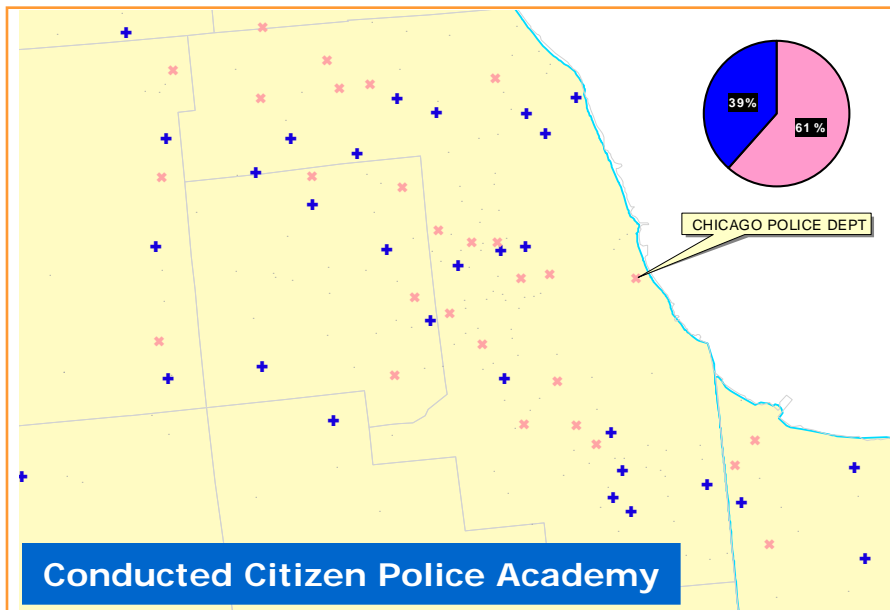
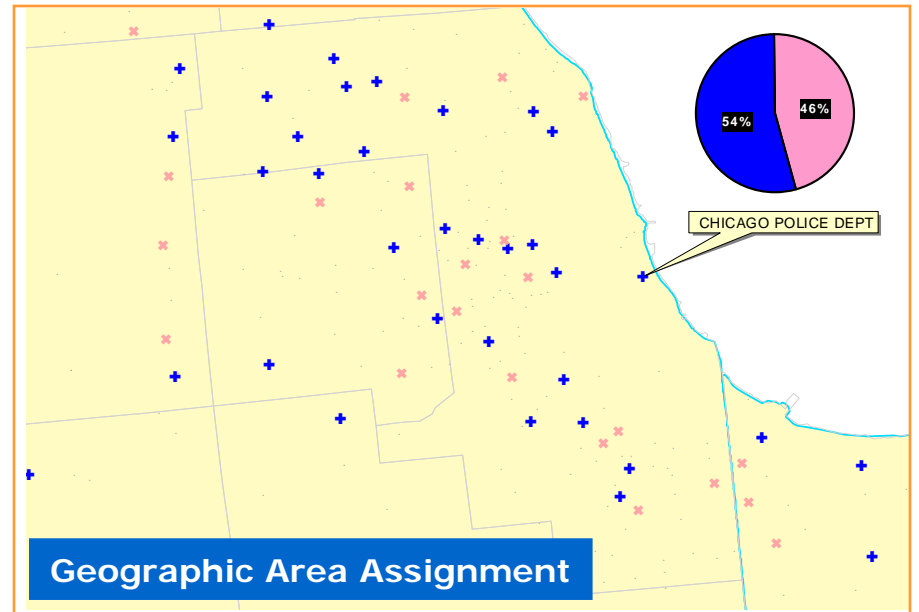
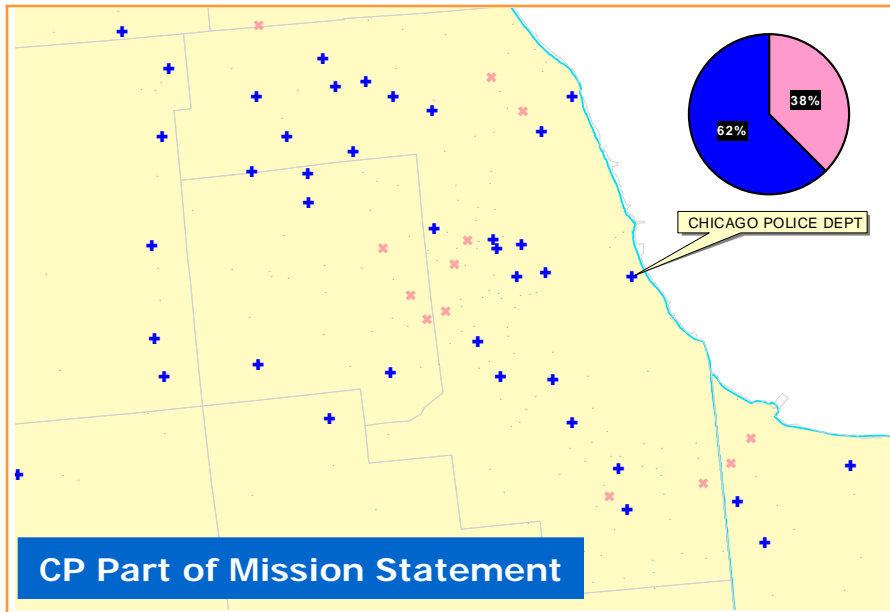
**Sampled Municipal LEAs: Conducted Citizen Police Academy**

- + No (1154)
- + Yes (729)
- Full Census
- State Boundaries

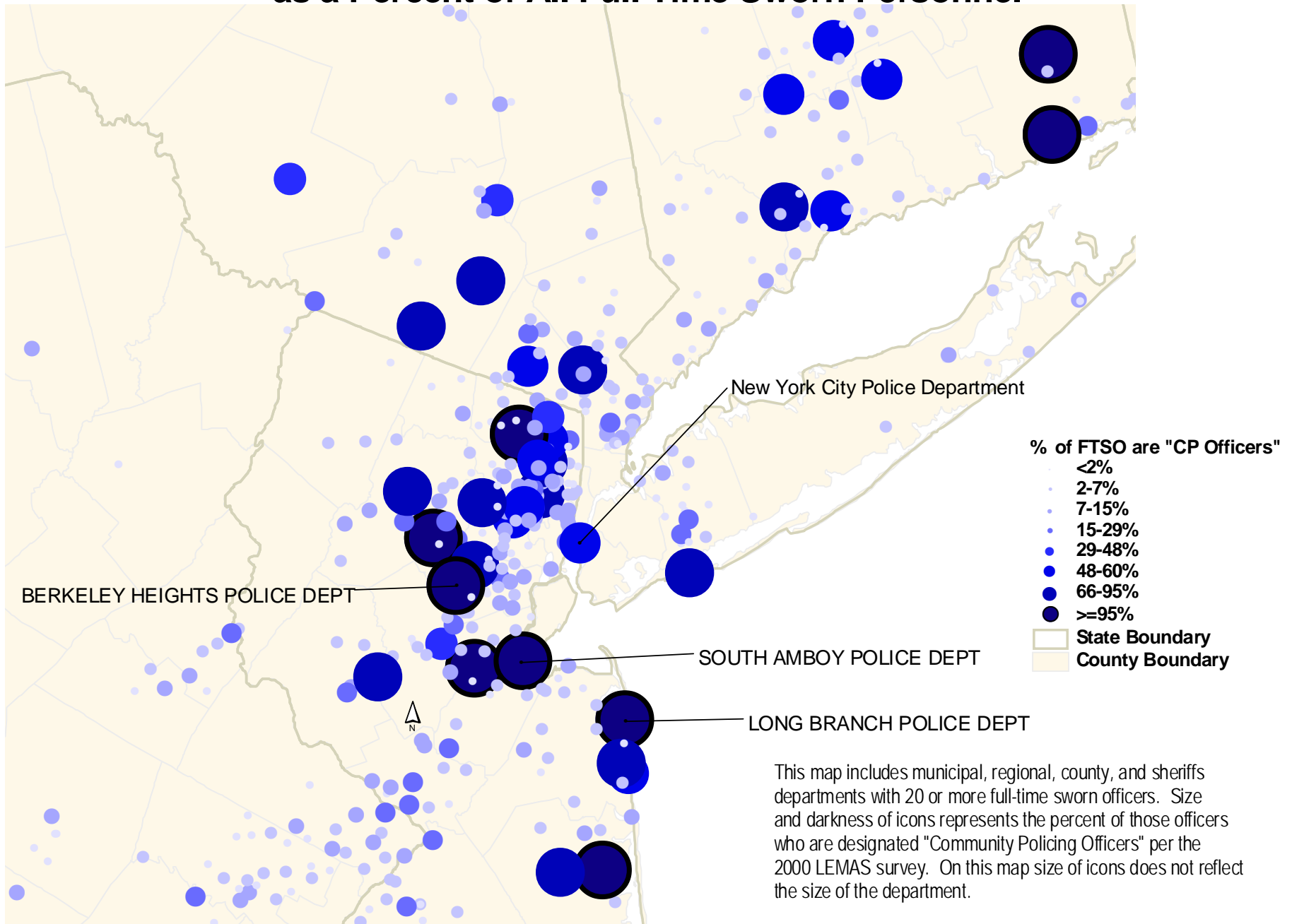
Source: 2003 LEMAS Survey  
Type(s): Municipal Sampled  
Count: 1883



# Four Indicators of Community Policing

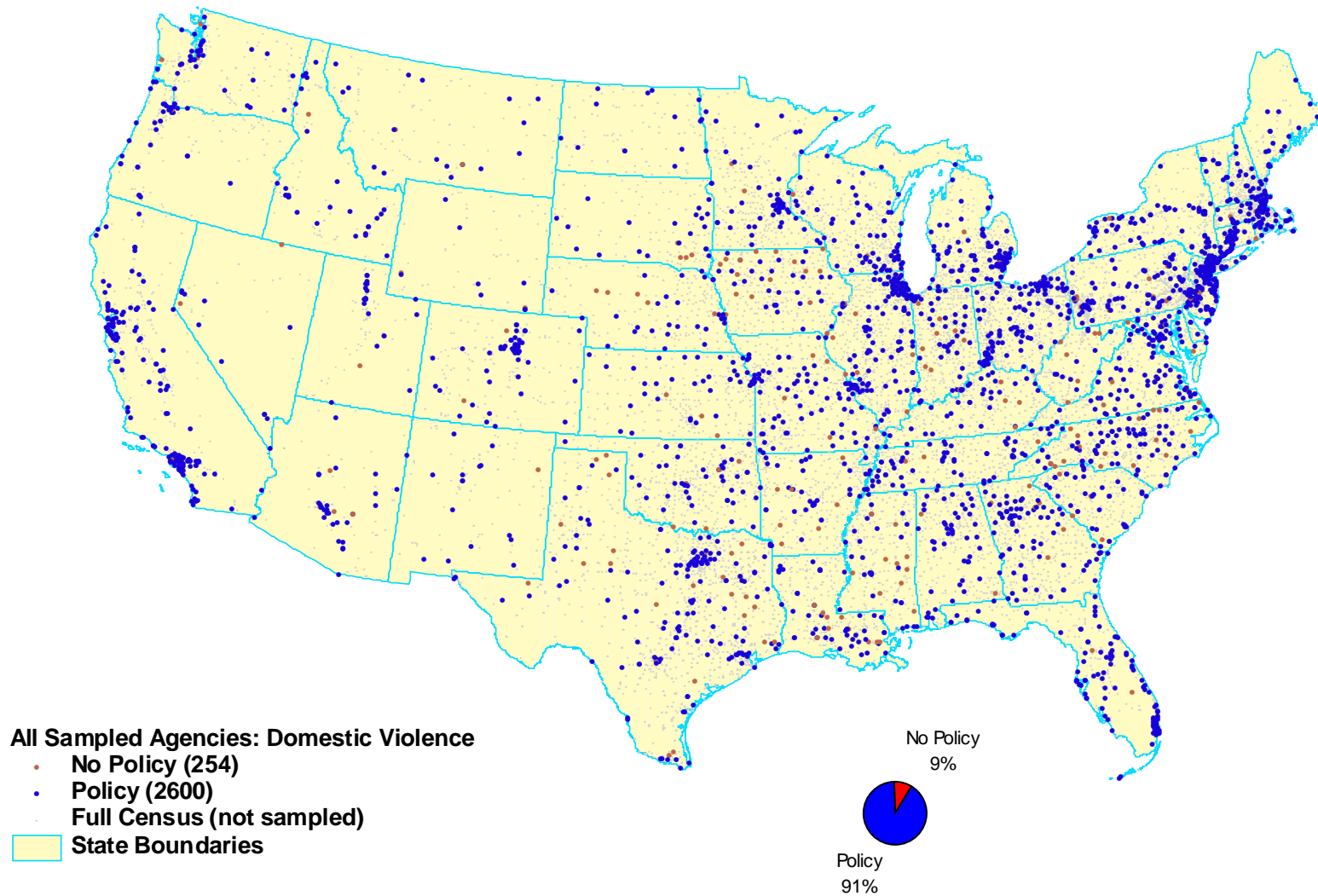


# Community Policing Officers as a Percent of All Full Time Sworn Personnel



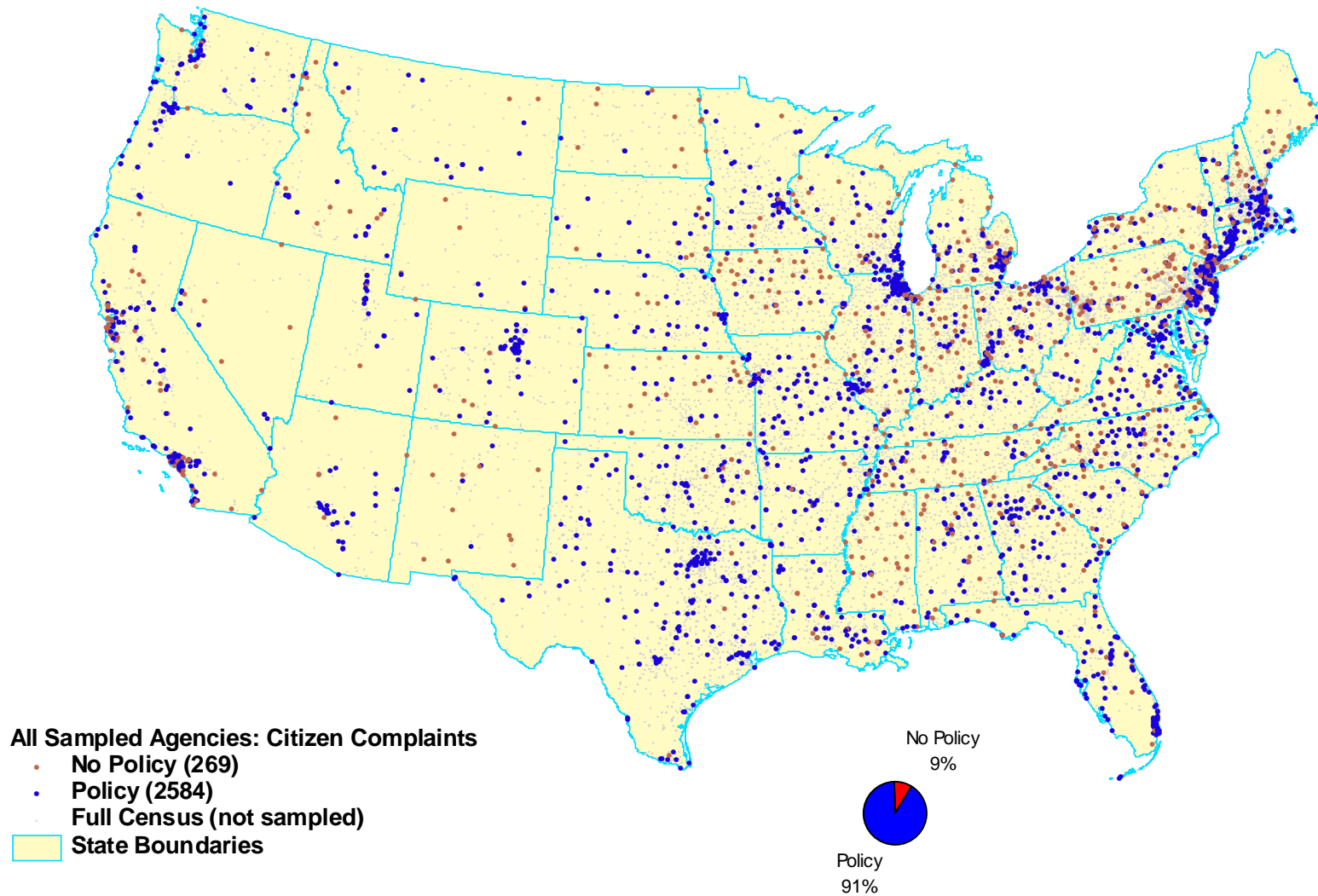
# Does your agency have a written policy directive on the following?

## Domestic Violence



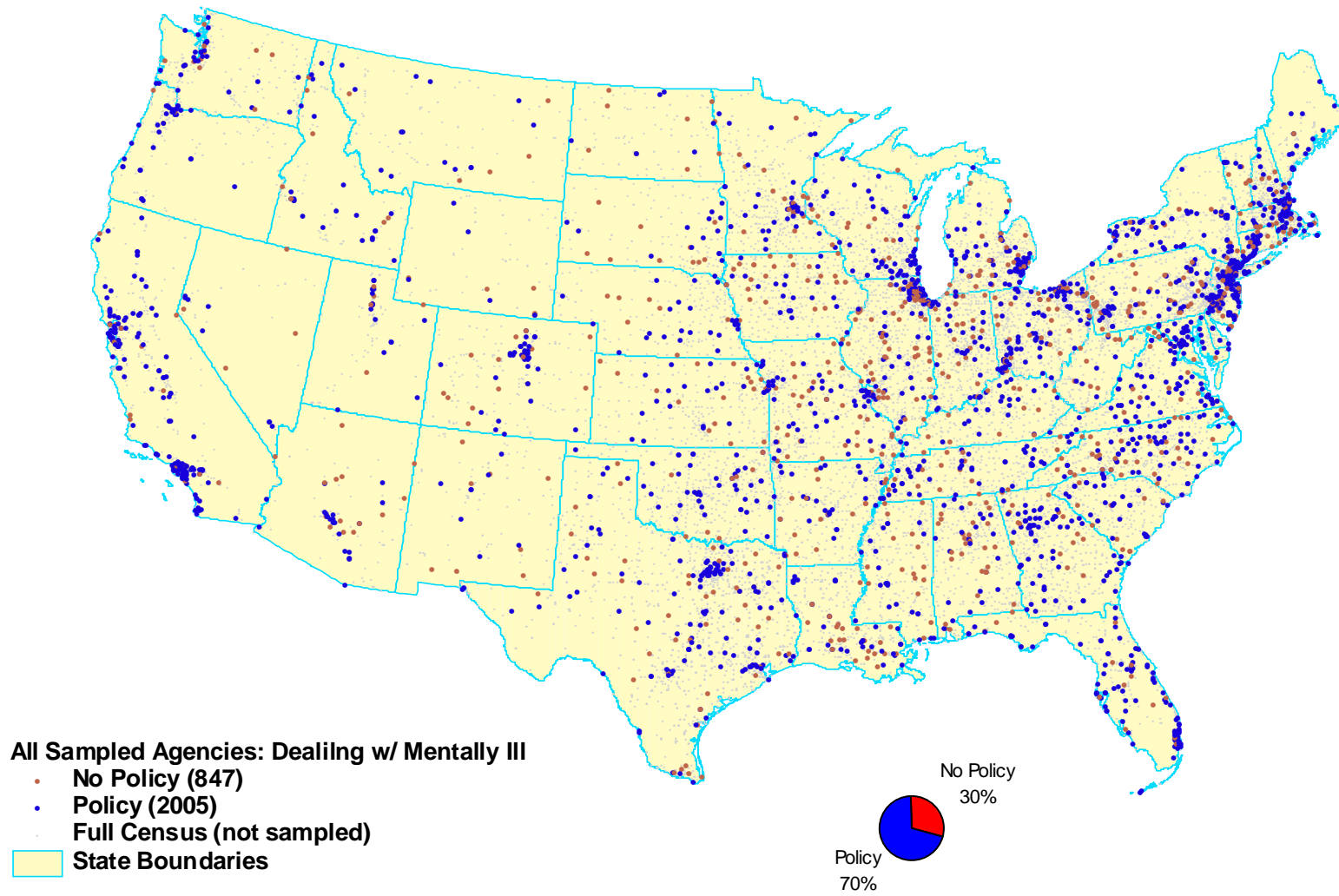
# Does your agency have a written policy directive on the following?

## Citizen Complaints



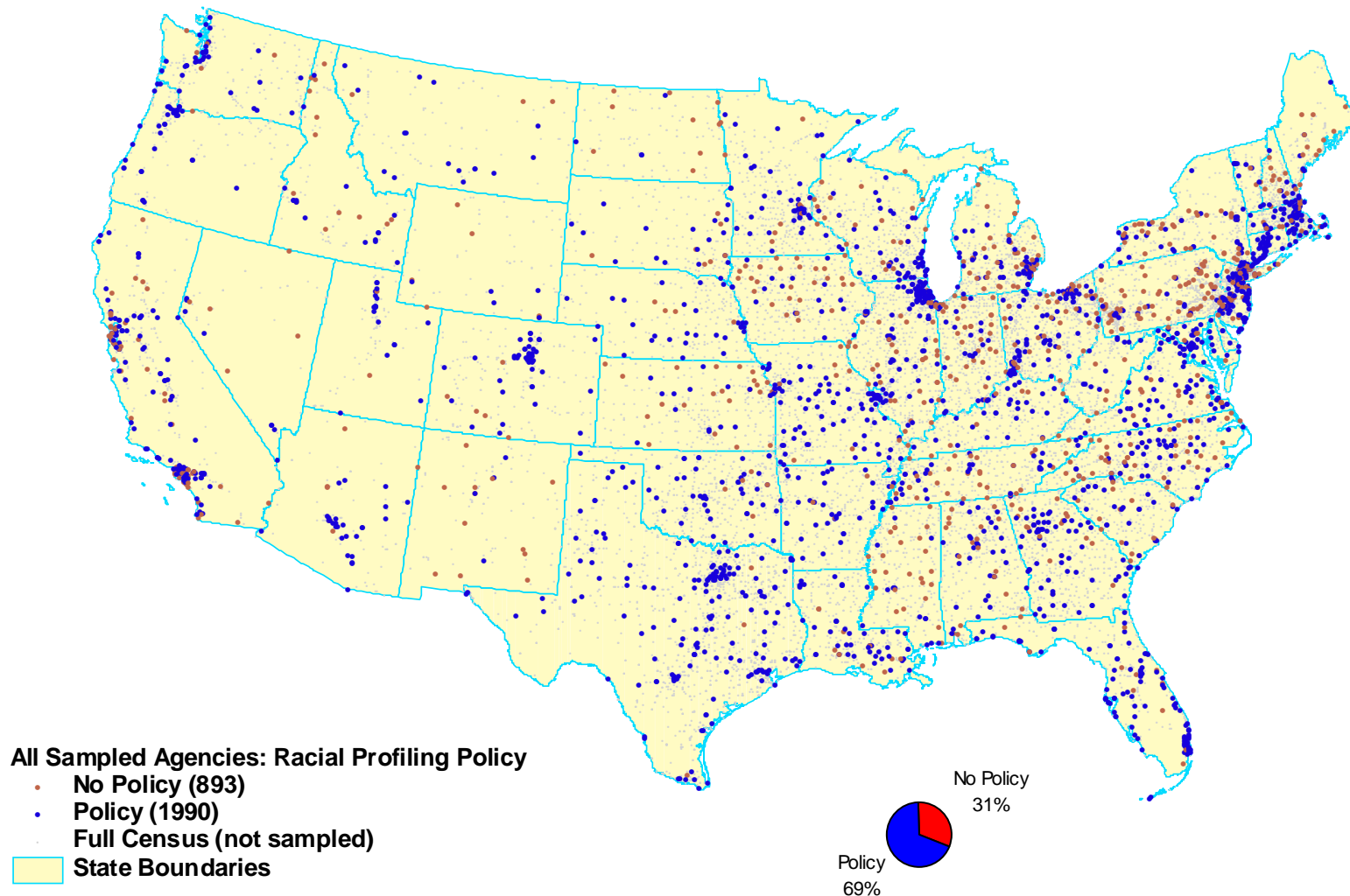
# Does your agency have a written policy directive on the following?

## Dealing with the Mentally Ill



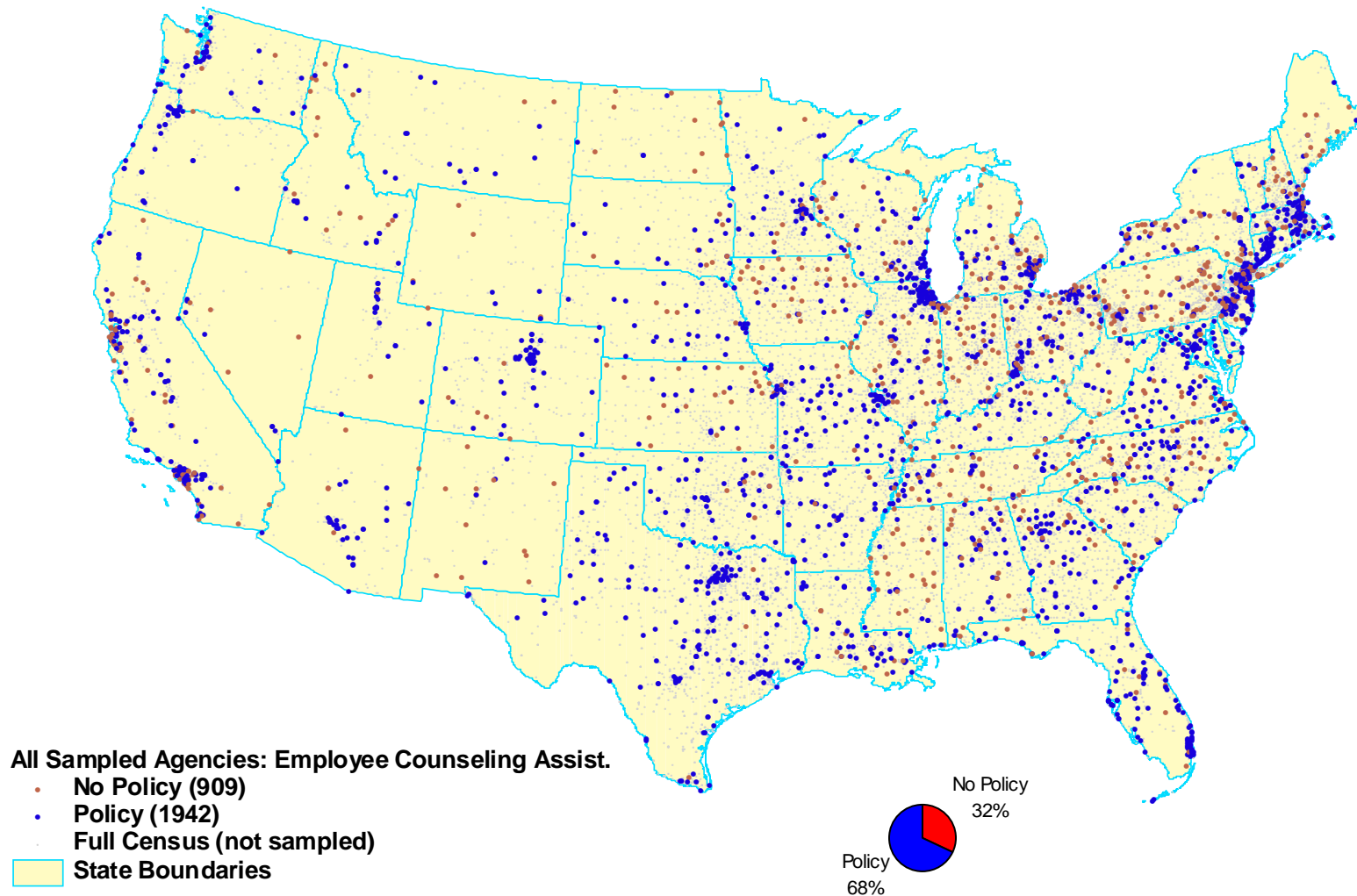
Does your agency have a written policy directive on the following?

## Racial Profiling



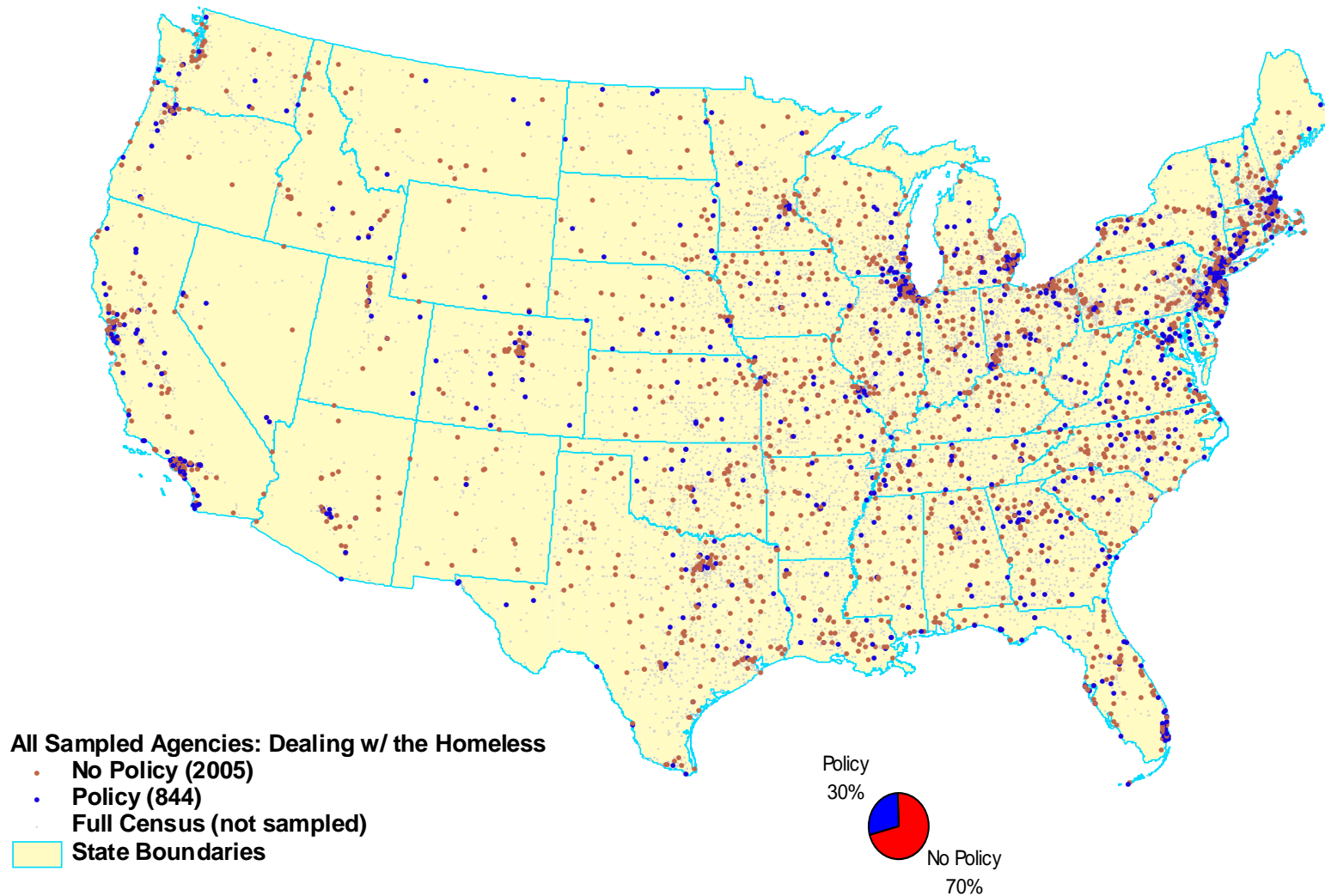
# Does your agency have a written policy directive on the following?

## Employee Counseling Assistance



# Does your agency have a written policy directive on the following?

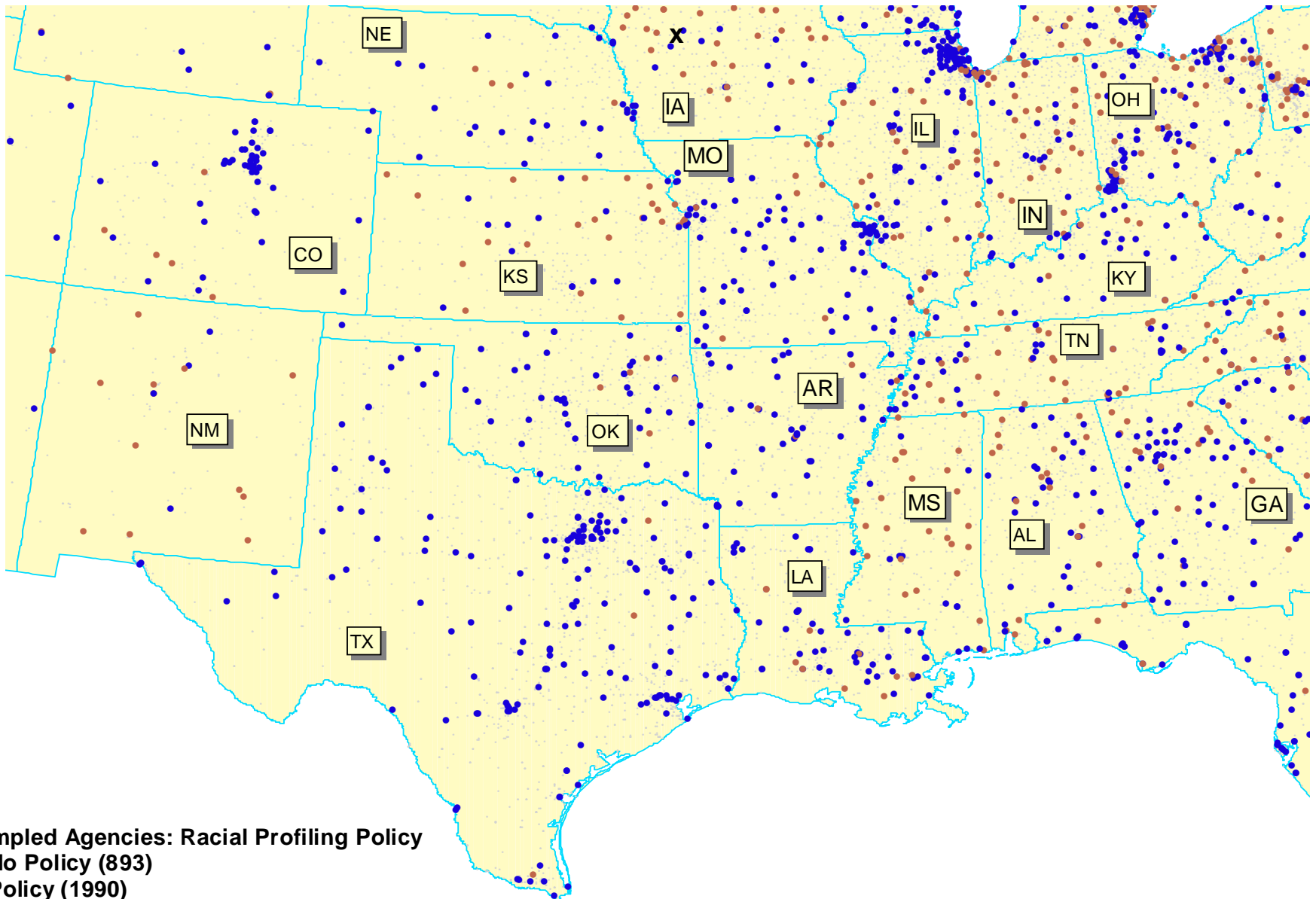
## Dealing with the Homeless





Does your agency have a written policy directive on the following?

Racial Profiling



All Sampled Agencies: Racial Profiling Policy

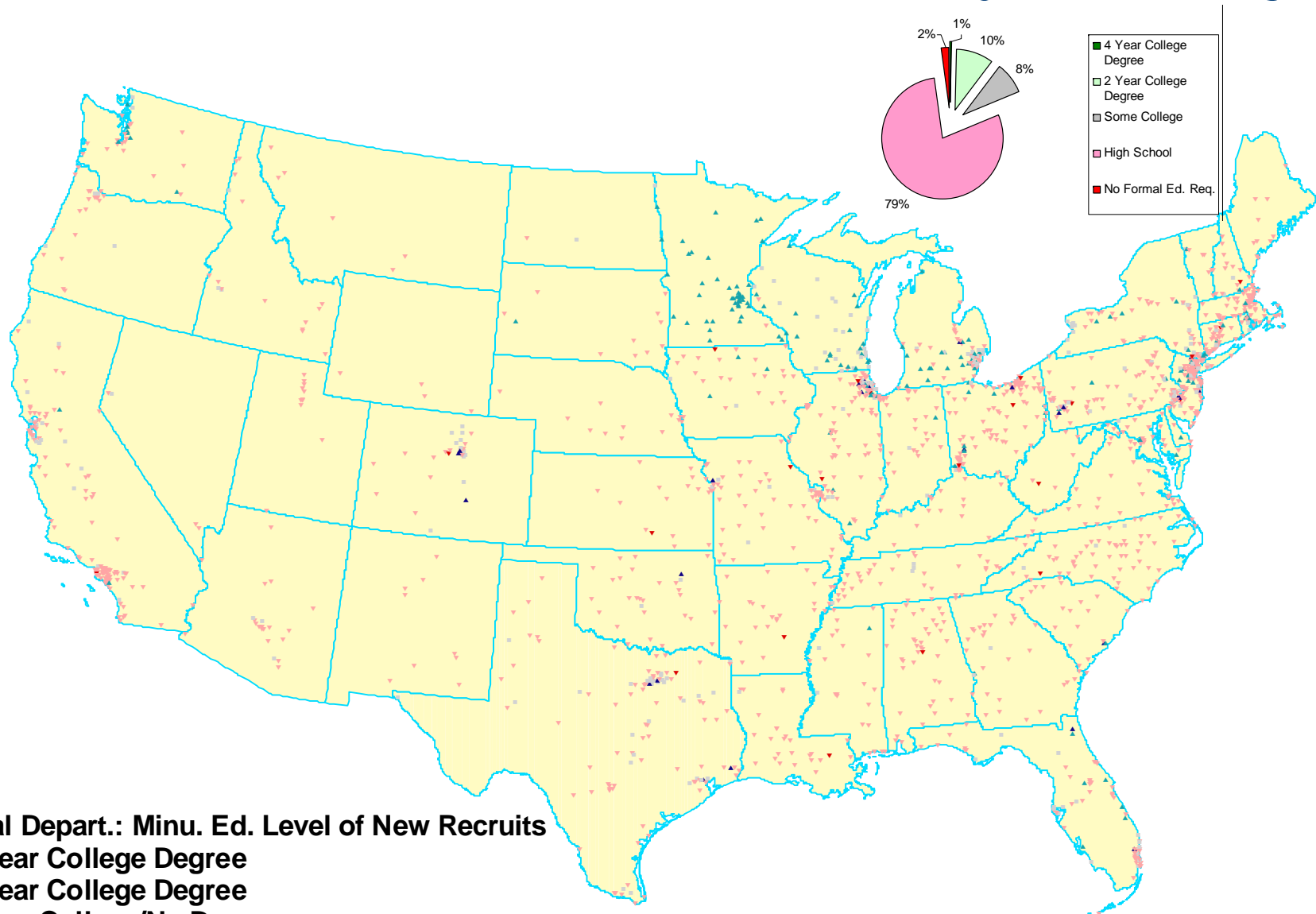
• No Policy (893)

• Policy (1990)

• Full Census (not sampled)

State Boundaries

Indicate your agency's minimum education requirement which new (non-lateral) officer recruits must have within two years of hiring.



**Municipal Depart.: Minu. Ed. Level of New Recruits**

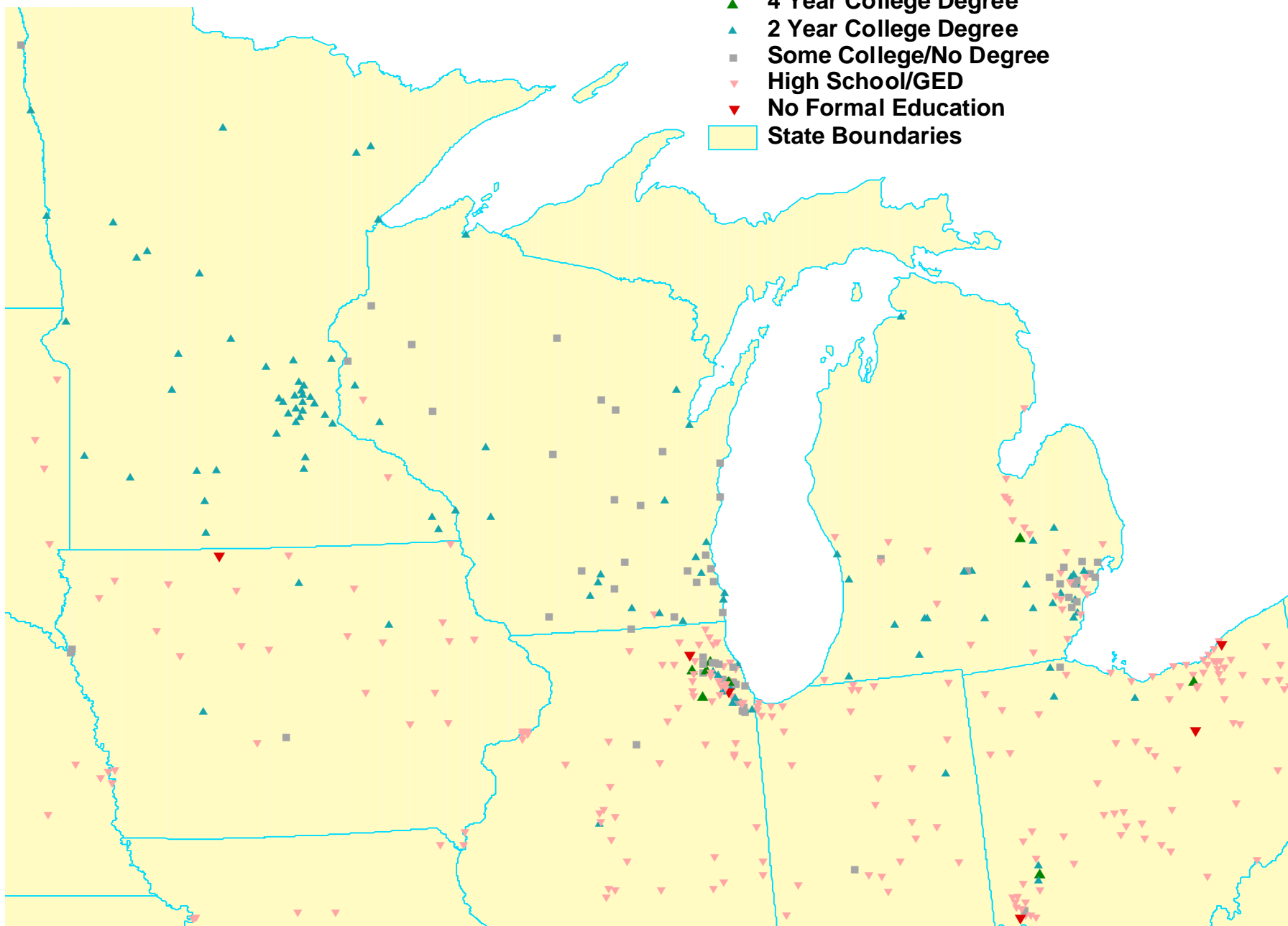
- ▲ 4 Year College Degree
- ▲ 2 Year College Degree
- Some College/No Degree
- ▼ High School/GED
- ▼ No Formal Education

State Boundaries

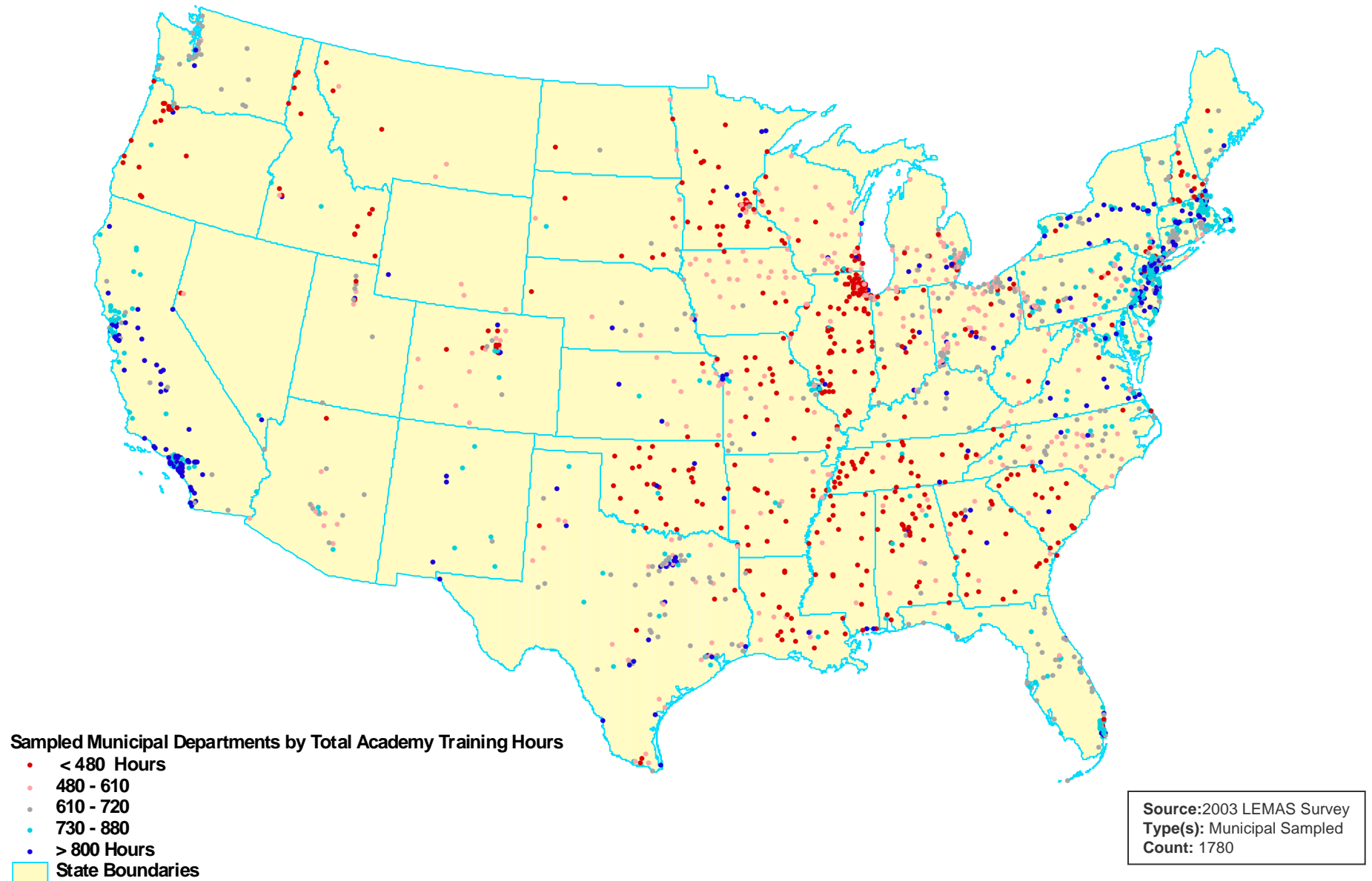
Source: 2003 LEMAS Survey  
Type(s): Municipal Sampled  
Count: 1780

**Municipal Depart.: Minu. Ed. Level of New Recruits**

- ▲ 4 Year College Degree
- ▲ 2 Year College Degree
- Some College/No Degree
- ▼ High School/GED
- ▼ No Formal Education
- State Boundaries



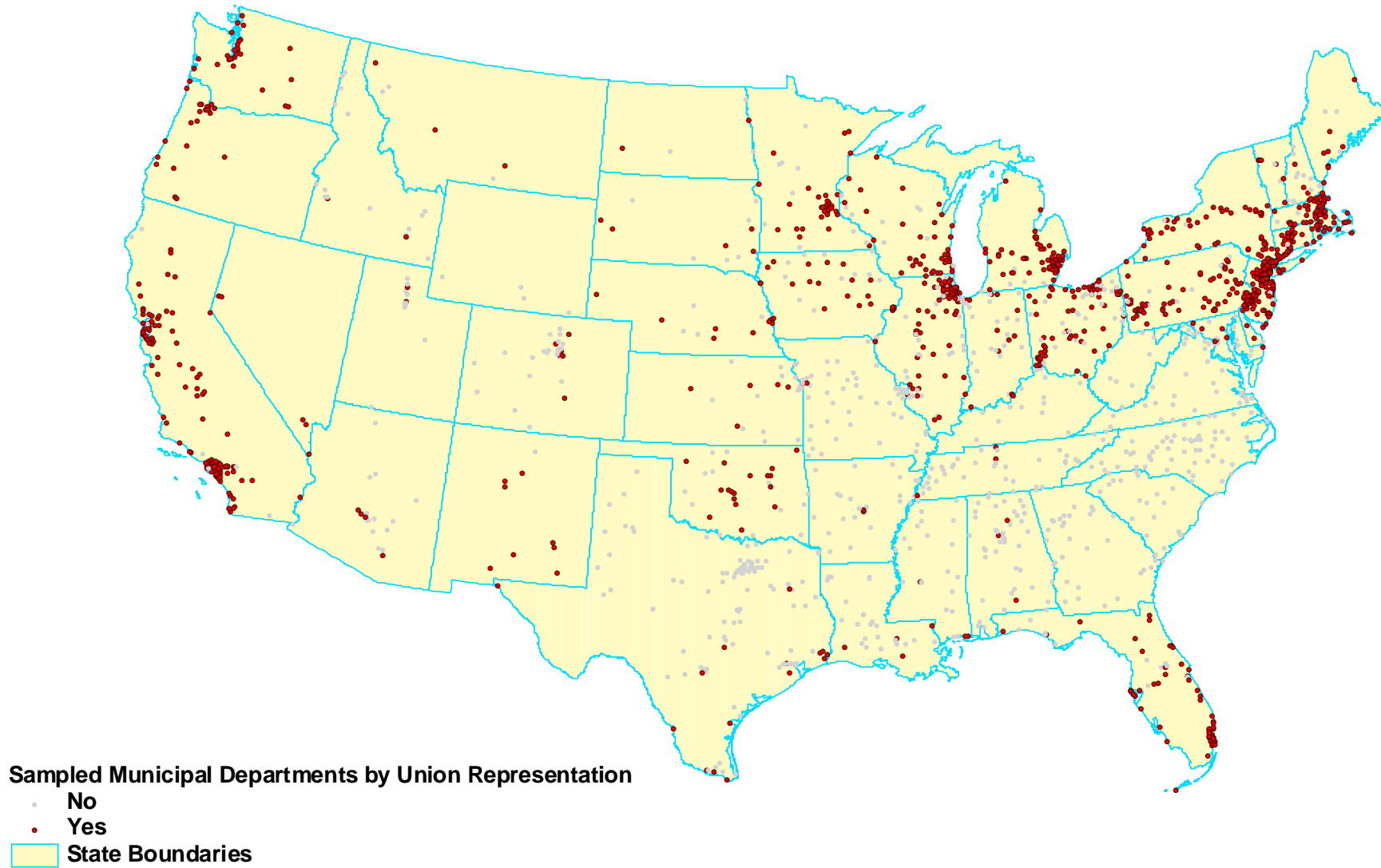
# Total Number of State Mandated and Additional Academy Training Hours



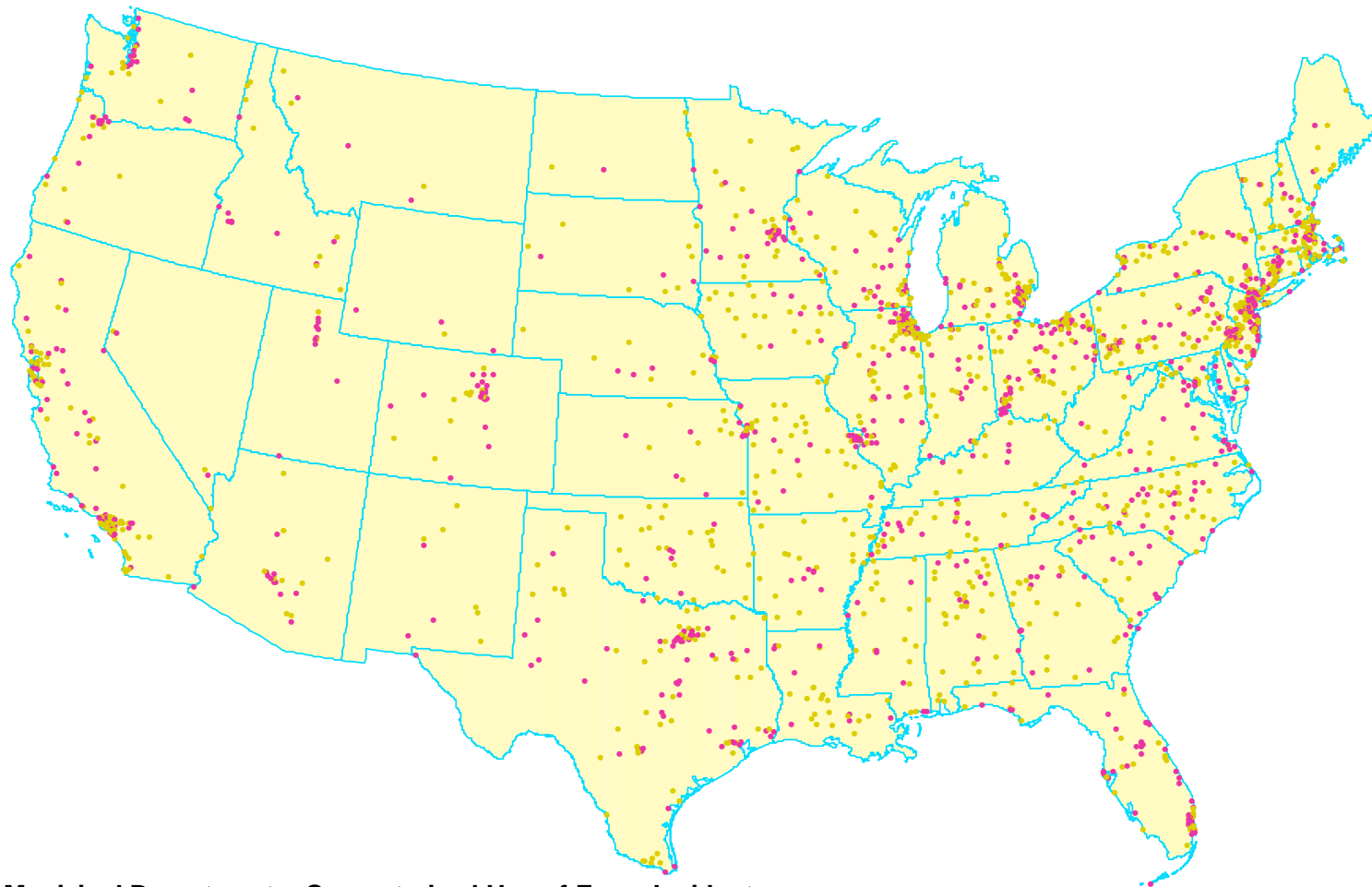
- <100
- 100 - 320
- 330 - 480
- 480 - 640
- >=640

**Source:**2003 LEMAS Survey  
**Type(s):** Municipal Sampled  
**Count:** 1780

# Is collective bargaining authorized for your agencies sworn employees?



Does your agency maintain its own computerized files with any of the following information?: Use-of-force incidents



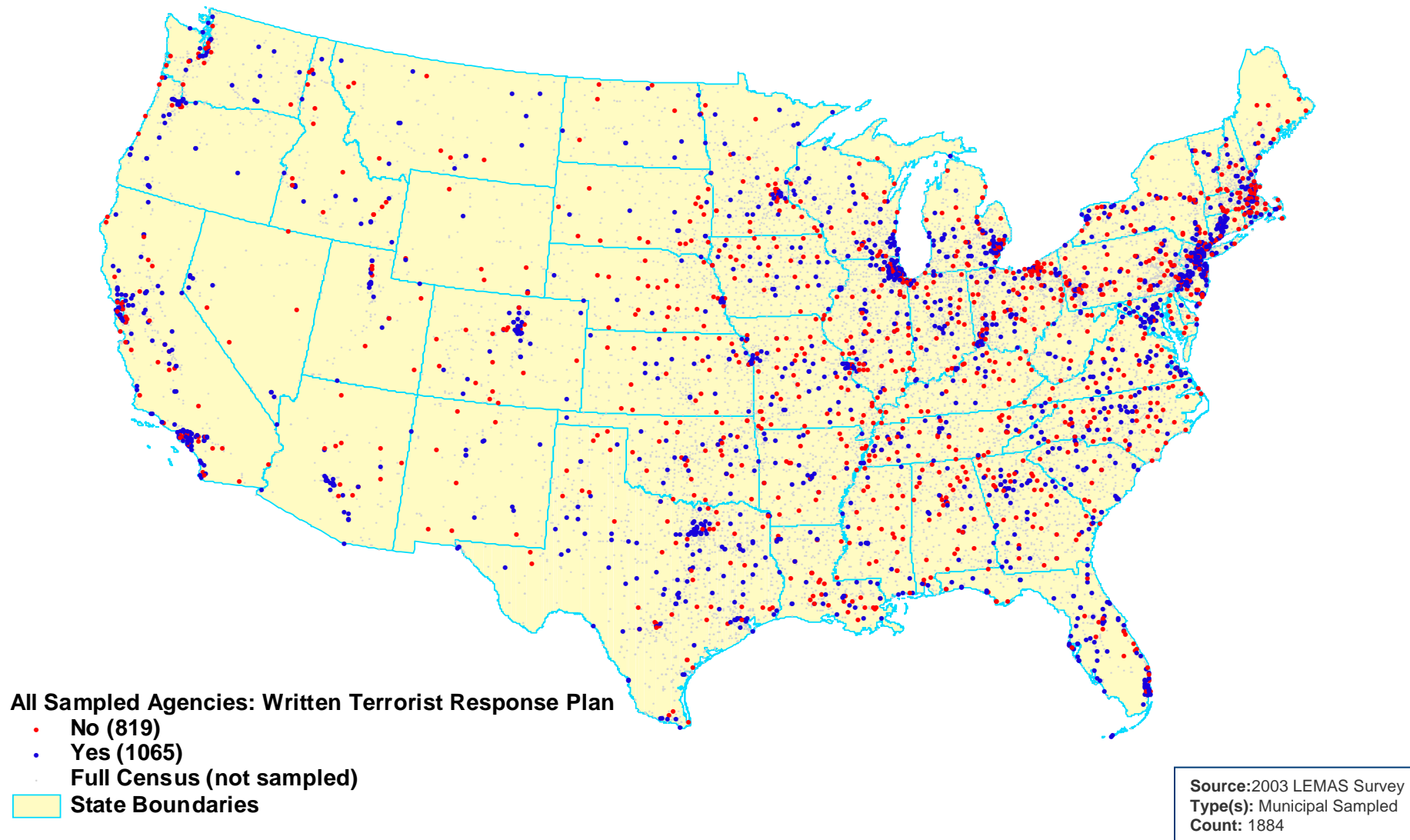
**Sampled Municipal Departments: Computerized Use-of-Force Incidents**

• Does Not Maintain (1095)

• Does Maintain (790)

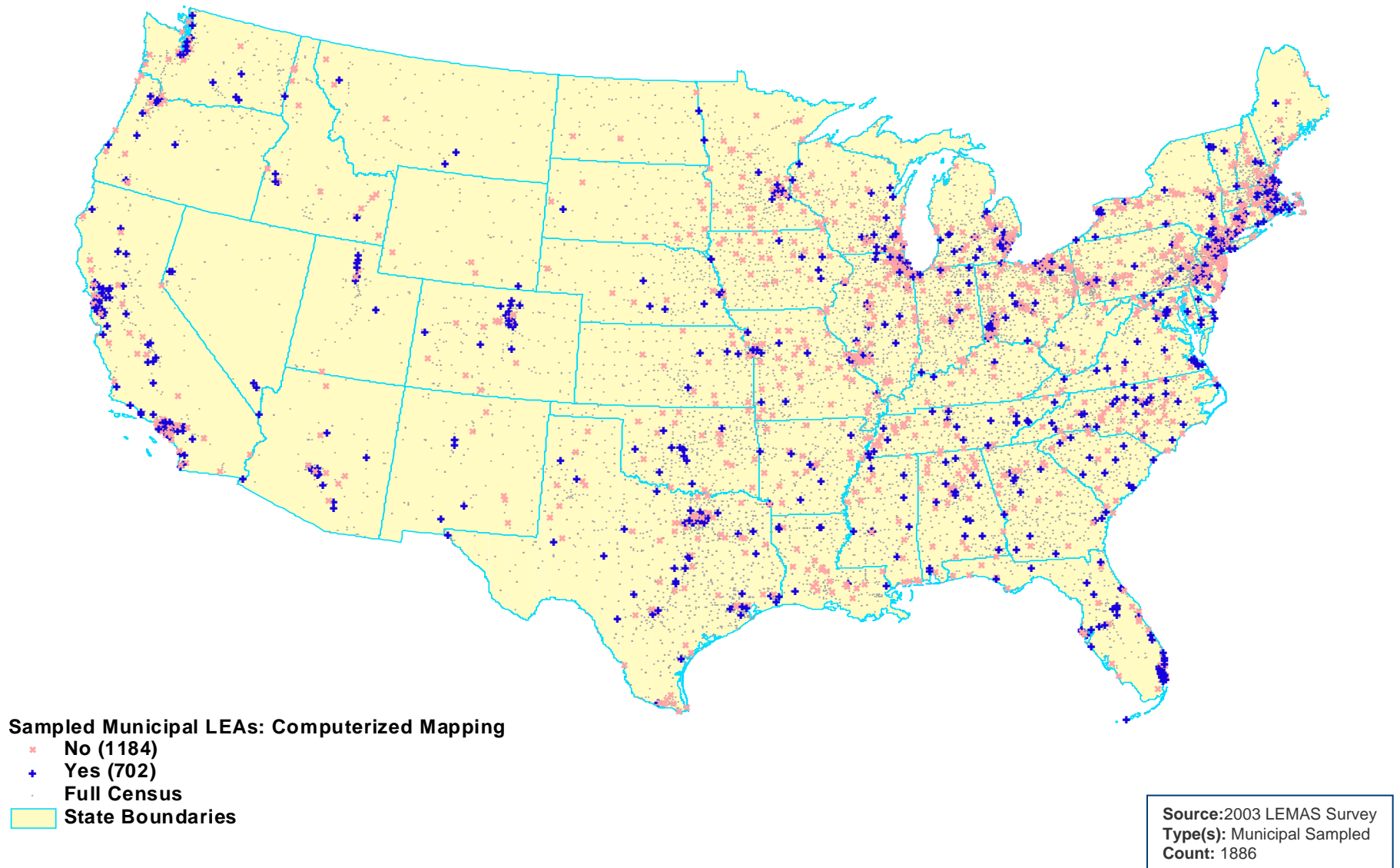
State Boundaries

# Does your agency have a written plan that specifies actions to be taken in event of terrorist attacks?

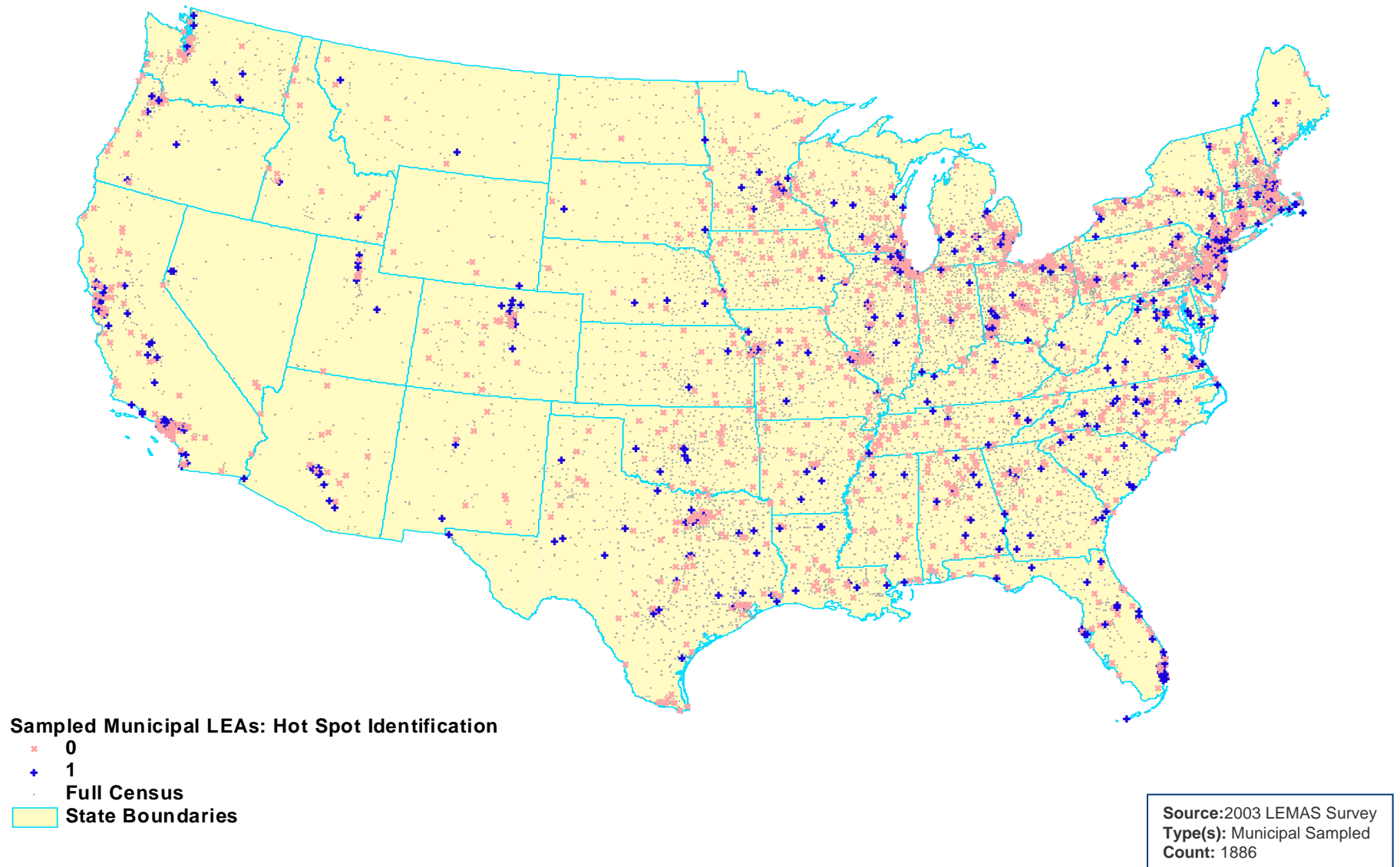




# Does your agency use computers for any of the following functions?: Crime Mapping

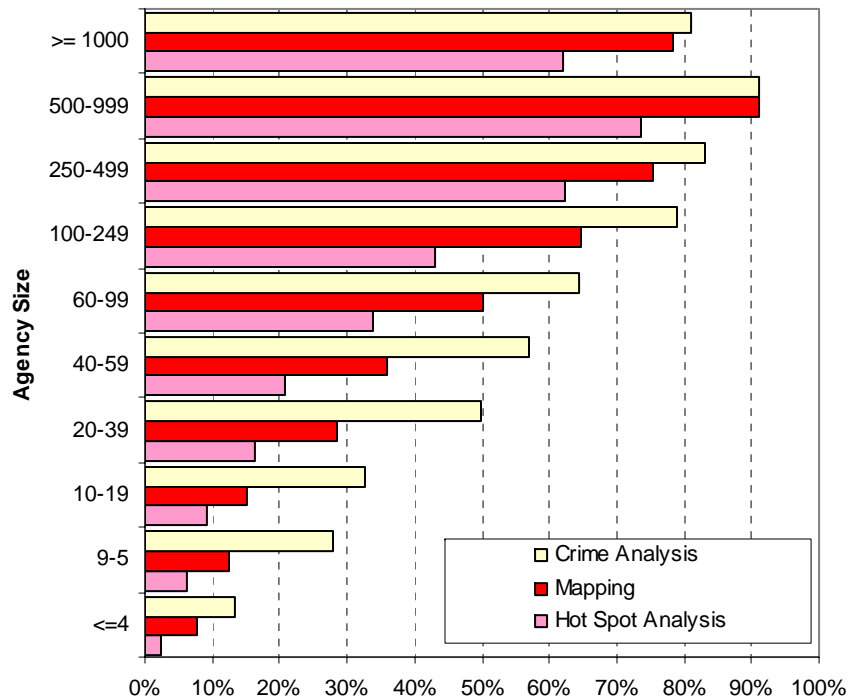


# Does your agency use computers for any of the following functions?: Hot Spot Identification

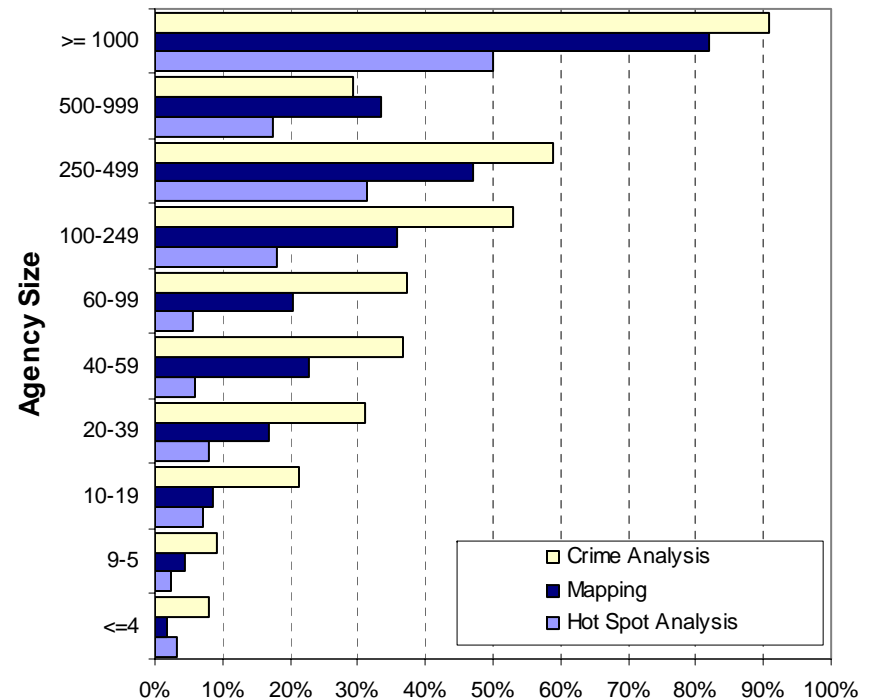


# Crime Analysis, Crime Mapping, and Hot Spot Analysis by Agency Size Municipal LEAs and Sheriffs' Offices

**Municipal Law Enforcement Agencies  
Computers Used for Selected Tasks  
by Agency Size (# full-time sworn with arrest power)**



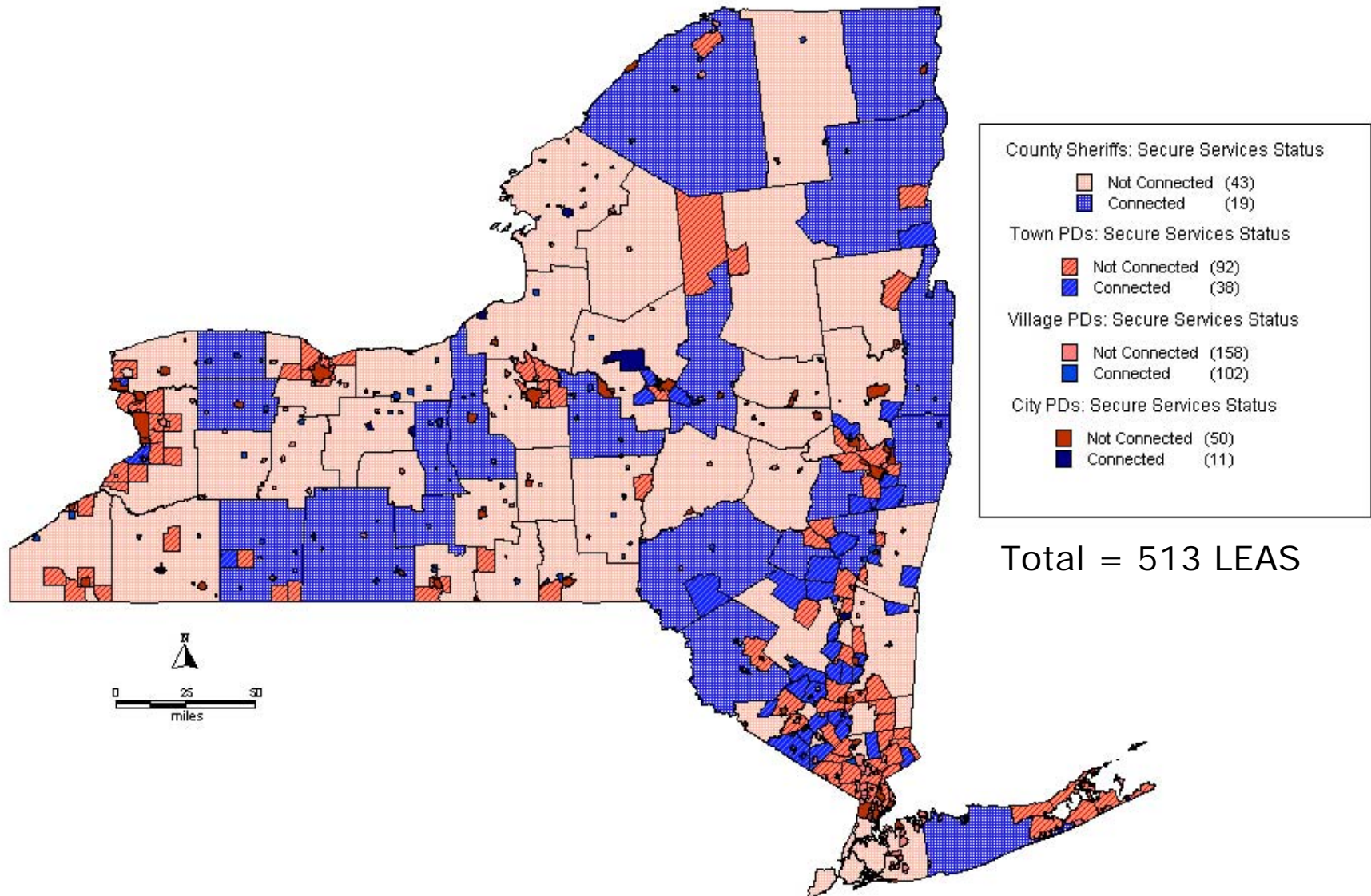
**Sheriffs Departments  
Computers Used for Selected Tasks  
by Agency Size (# full-time sworn with arrest power)**



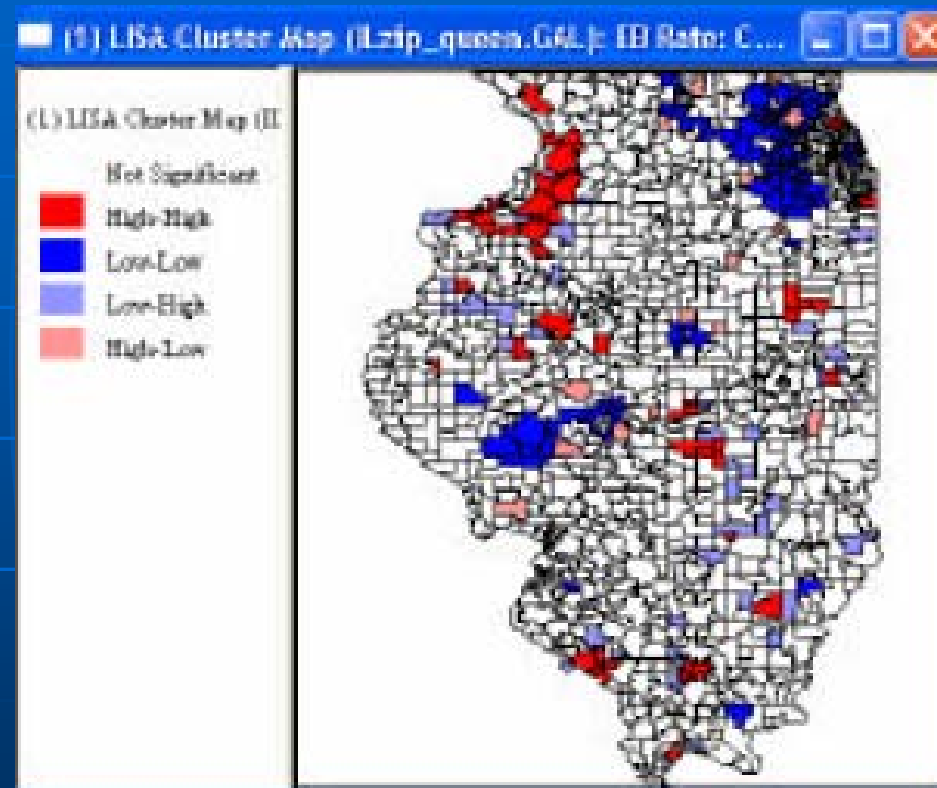
# Next Steps - Methodological

- Consider possibility of full surveys on regional basis or for selected questions
  - Add questions to the census questionnaire
  - Possible supplement/ad hoc sampling at state or regional level (e.g., USDOT traffic flow studies)
  - Expand LEMAS survey geographically and otherwise (as recommended by the National Research Council)
- Link to other sources of agency-level data
- Use with polygon data instead of relying on point data to create thematic maps
- Create Polygons for all 18,000 state and local LEAs in the U.S.

# New York State Secure Services Connections by Agency Type (2003)



# LISA Cluster Maps





# Next Steps – Practical Applications

## Capitalizing on Power of GIS and Data Inventories

### ■ Regional Planning/Data Sharing

- Identify service gaps for law enforcement critical responses
- Evaluate regional redundancies for seldom used services
- Establish more efficient mutual aid agreements
- Homeland security planning/coordination

### ■ Integrate with other data for strategic analysis

- The Census of Law Enforcement Training Academies (LEMAS)
- Demographic Data
- Critical Infrastructure
- Fire and EMS

# LEMAS Data Sources

- BJS-LEMAS background, summary reports, census & survey questionnaires  
<http://www.ojp.usdoj.gov/bjs/lawenf.htm>
- Download data files at *Inter-university Consortium for Political and Social Science Research* (ICPSR) <http://www.icpsr.umich.edu/>



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